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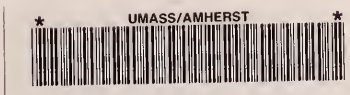

DRAFT

for Water Resources Commission Approval

TAUNTON RIVER BASIN PLAN

Prepared for the

Massachusetts Water Resources Commission

by

Massachusetts Department of Environmental Management
Division of Resource Conservation
Office of Water Resources

Richard H. Thibedeau
Director

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EXECUTIVE SUMMARY

Taunton River Basin Plan

This basin plan has been prepared for the Water Resources Commission as part of its responsibility to plan for long range water resources management in Massachusetts. A similar plan has been or will be prepared for each of the 27 river basins in the Commonwealth to provide a comprehensive analysis of existing and projected water uses, an understanding of the hydrologic characteristics of each basin, and to present recommendations on sound water resources management. The following points summarize the main findings of the Taunton River basin plan.

Population and Water Demand

- The current population of the 31 communities in the Taunton River Basin Study Area is approximately 617,000, and the average day demand (ADD) by public water suppliers is 72 million gallons per day (mgd). Demand for water is projected to increase by 17 mgd to 89 mgd by 2010 due to increases in population, gallons used per capita per day, and the growth of industrial and commercial water use.

- It is recommended that the projected increase in demand be modified by the implementation of water conservation measures in each community. The plan includes recommended conservation goals for each community and provides several conservation scenarios for the basin.

- Twenty-nine communities in the study area use the Taunton River basin as a source for all or some of their public drinking water supply. Only Plympton and Lakeville do not have public water supply systems.

- Of the total water supply (ground and surface sources) for Taunton River basin communities, 48 mgd (72%) was obtained from sources within the basin. Five other river basins supplied the remaining 19 mgd.

- Ninety-two ground water sources supplied 27.80 mgd or 41 percent of the water used by public water supply systems in the study area in 1986. Of these, 71 are located within the Taunton River basin and 21 are located in other basins (Ten Mile, Buzzards Bay, Narragansett Bay and Mt. Hope Bay Shores, Neponset, and Charles). The other 59 percent of water provided came from 13 surface water sources, nine of which are located within the Taunton basin and four located in the South Coastal basin.

Hydrologic Analysis

- The Taunton River Basin drains 562 square miles in southeastern Massachusetts and follows a 36 mile course from the confluence of the Town and Matfield Rivers in Bridgewater to the Mount Hope Bay. The basin contains over 94 square miles of wetlands, many lakes and ponds, and some of the most productive cranberry bogs in the country. The largest wetland area is Hockomock swamp (11.7 square miles) which has been designated as an Area of Critical Environmental Concern.

- The mean annual flow of the river at the State Farm gage in Bridgewater (in operation 1930-1975 and 1985-1988) is 480 cubic feet per second (cfs), with an average monthly fluctuation from 150 cfs in August to 961 cfs in March. The flows in the Taunton River fluctuate slowly due to the wetland areas, the stratified drift, and the flat gradient. These characteristics help to attenuate rapid changes in flow. The basic hydrological analysis underpinning this report was prepared by the U.S. Geological Survey in cooperation with DEM/Office of Water Resources.

- For planning purposes, basin water resources were analyzed from yields calculated for a moderate drought period such as the one which occurred in 1980-1981. Natural yields in the 25 Taunton subbasins were analyzed to assess how much water is available prior to considering a minimum streamflow threshold or the impacts of streamflow regulation. The analysis examined yields available 95 percent of the time during the planning drought.

- Natural yields were adjusted to reflect regulation in order to determine remaining available yields and to contribute to the development of a minimum streamflow threshold. Three subbasins are gaged by continuous record gaging stations maintained by the U.S. Geological Survey. Low flow measurement sites established by the U.S. Geological Survey in response to DEM requests assisted in generating streamflow data on subbasin yields during drought periods.

- The Taunton River and many of the tributaries (subbasin) have relatively strong low flows under natural conditions. This is due primarily to the fact that much of the basin is underlain by stratified drift (62%) which stores and yields groundwater to streamflow between precipitation events. The overall river basin and many of the tributaries are projected to sustain high general environmental quality even during drought conditions. However, a few subbasins (primarily in the northeastern section of the basin) have low percentages, on an areal basis, of stratified drift. This results in weaker low flows. In a few of these weak subbasins, yields have been reduced due to out of subbasin disposal of withdrawn water.

- In a number of subbasins, the river is hydrologically stressed

as existing withdrawals for water supplies exceed the yield that is present for 95 percent of the time during the planning drought. In a few cases, the yield may be higher than indicated since net outflow may be from surface storage and thus not directly affect ground water levels.

Minimum Streamflow Threshold

- The Taunton River and its tributaries are used for recreation, water supply, receipt of treated wastewater effluent, and to sustain wildlife, wetlands, and other valuable natural systems. Establishing a minimum streamflow threshold provides an increased level of protection to the instream uses and functions of the river. To assess the streamflow needs of the various uses, data on their location, the volume of flow required, and time of year the volume is needed are obtained by the Office of Water Resources from several state agencies, local community officials, conservation organizations, and other groups.

- The available flow at each location is calculated and compared to the estimated flow needs for each water use. The threshold is iteratively lowered, raised, and tested in an analytical model to determine a threshold that will satisfy most needs while protecting the environmental quality of the basin. In the Taunton, as in other river basins, there is not enough flow to satisfy all uses, requiring a balancing of uses.

- The recommended minimum streamflow threshold for the Taunton River basin is 0.22 cubic feet per second per square mile of watershed which corresponds to a flow of 57 cfs at the State Farm gage. In addition, the plan recommends a minimum streamflow threshold of 0.15 cfsm for 10 subbasins due to their different geologic characteristics. These areas are primarily underlain by glacial till which are hydrologically weaker than the areas underlain by stratified drift. Because the till areas naturally sustain lower base flows, a lower minimum flow was determined.

Community Recommendations

- The basin plan provides a summary of each public water supply system, the current and projected water demand, and current and projected water supply sources for each community in the study area,

- The community summaries include recommendations for water resource management, a description of existing conservation measures, future conservation plans, and water conservation recommendations.

- In several subbasin areas, it is recommended that no additional water supply withdrawals be made because of estimated hydrologic stress during drought conditions due to

existing withdrawals or because of particularly sensitive wildlife habitats.

Conservative Planning Approach

The basin plan provides a conservative approach to the resources and needs of the basin in the following ways:

o **Water Demand Projections** are based on the most accurate population projections available; the demand projections incorporate a GPCD increase to address normal commercial and industrial growth.

o **Planning Drought** The analysis uses the stream flow characteristics of the 1980-1981 drought as the planning period to test new water sources.

o **Ground water/surface water connection** The analysis assumes all withdrawals within a basin directly affect the flow of the main stem and tributaries by intercepting runoff or recharge.

o **Water Conservation** The plan includes three water conservation goals, including provision for all projected public water supply demand to be met by water conservation.

o **Minimum Streamflow** The plan sets a year round threshold to address fisheries and other instream needs; provides specific recommendations to protect anadromous and resident fisheries, native and stocked streams; and identifies environmentally sensitive areas

o **Subbasin analysis** Plan identifies stressed subbasins and recommends new sources (after conservation) in stronger subbasins

o **Water Management Act** The minimum streamflow recommendations are used by DEP in administering the Water Management Act permitting process; as applied in several eastern Massachusetts river basins, the permitting process has significantly limited the amount of water available for future withdrawals.

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RIVER BASIN PLANNING PROCESS

A. Introduction

The Massachusetts Water Resources Commission has the primary responsibility for determining state water resources policy and directing water resources planning activities for the Commonwealth through the Executive Office of Environmental Affairs. The Office of Water Resources (OWR), in the Department of Environmental Management, provides technical staff support to the Commission and is responsible through the Commission for long-range water resources engineering and planning for the Commonwealth. The central element in the development of the statewide water resources management plan is the preparation of a management plan for each of the twenty-seven river basins of the Commonwealth. These plans are being developed pursuant to the Water Resources Planning Regulations, 313 CMR 2.00. The river basin planning program is part of the state's overall goal of insuring that water is available in sufficient quantity and quality to meet current and future consumptive and non-consumptive water needs for Massachusetts. The basin planning process includes local, regional, and state assessments of water needs and the availability of water resources and reflects the state's water resources management policies:

Supply Management - Utilizing local sources (those within a river basin) first and protecting and preserving all sources of water supply;

Demand Management - Reducing water demand through water conservation, true pricing, and long-range planning;

Administrative Management - Strengthening local water management through financial and technical assistance and planning guidance.

The river basin planning process consists of six steps:

1. Inventory of the basin's consumptive and non-consumptive water uses
2. Analyze data and identify the future water needs in the basin
3. Develop and analyze alternatives to meet projected water needs and maintain minimum streamflow threshold
4. Prepare the basin water resources management plan
5. Adoption of the plan by the Water Resources Commission and implementation by EOEA agencies
6. Review and update plan every five years

Previous basin plans have consisted of three volumes describing in

detail the data gathering and analysis process and presenting results and recommendations. This basin plan consolidates all major sections in one volume. Although the presentation is reduced in size, the plan was developed with the same high professional standards as previous basin plans and is based on sound technical and scientific procedures.

The first section of the Taunton River Basin Plan consists of the inventory step of the planning process. It includes the identification of instream uses, current and projected water demand, existing water supply inflow-outflow analysis, and short- and long-term demographic profiles for communities in the study area.

Section II (Analysis) includes a Subbasin Yield (SUBY) Analysis. The SUBY analysis quantifies the amount of water available in each subbasin as a basis for determining stressed subbasins and a minimum streamflow threshold which is recommended in section III. This section also identifies the water supply sources by basin, inventories instream uses, and describes the water quality in the basin.

Section III of the Taunton River Basin Plan presents recommendations to meet the many consumptive and non-consumptive uses of the water resources of the Taunton River basin. This section includes recommendations for a Minimum Streamflow Threshold, water conservation, and municipal water resources management. The Minimum Streamflow Threshold provides an increased level of protection for a variety of instream uses, including wildlife, fisheries, irrigation, recreation, wetlands, and includes the needs of public and private water supply and the receipt of treated wastewater. The minimum streamflow threshold is determined through an iterative analysis of instream and out-of-stream flow needs, their locations, and hydrologic data.

Water conservation is stressed as the primary source of new supplies that should be considered by municipalities, and several scenarios are presented.

As described in the Water Resources Commission's Water Resources Planning Regulations (313 CMR 2.00), other state agencies will consider the Taunton River Basin Plan in decisions pertaining to water resources management in the Taunton River basin. In accordance with the provisions of the Water Management Act and Regulations, the Department of Environmental Protection (DEP) has been authorized to issue permits for water withdrawals over 100,000 gallons per day. In addition, in order to protect the public health and welfare, DEP can declare a state of water supply emergency (sections 15, 16, and 17 of MGL Chapter 21G and DWS policy statements) which insures "that no area served by a public water supply system will be without water". The Taunton River Basin Plan is one source of baseline information which will be used

in making these decisions. However, the recommendations in this volume do not preempt DEP's responsibilities for regulating and permitting, nor does this plan preclude the development of additional water sources.

B. Input to the Basin Planning Process

An integral part of the basin planning process is the interaction between the OWR planning staff and individuals, state agencies, and local groups regarding the information presented in the plan. Planning staff met with local water management officials in the Taunton River basin and had numerous telephone and mail contacts to obtain information and request their suggestions. A wide variety of groups and individuals reviewed the report drafts and provided comments on various issues. The determination of minimum streamflow threshold involved contacting and receiving comments from nearly a dozen state agencies. Comments from all these individuals and groups were considered, and, in some cases, a dialogue was established regarding a particular issue.

Portions of the original draft were circulated to over 50 agencies and groups for review. All comments received have been carefully considered for inclusion in this draft, and additional comments will be evaluated for inclusion in the final published version.

Through this interactive review process, the Taunton River Basin Plan incorporates the research, thought, and concerns of state, local, and regional groups within the basin planning framework established by the Water Resources Commission.

Because the river basin plans will be updated regularly to incorporate new research, adjustments to projections, new water uses, or more advanced analytical techniques, the plans provide a dynamic tool for water resources management.

I. INVENTORY

A. Taunton River Basin Hydrology

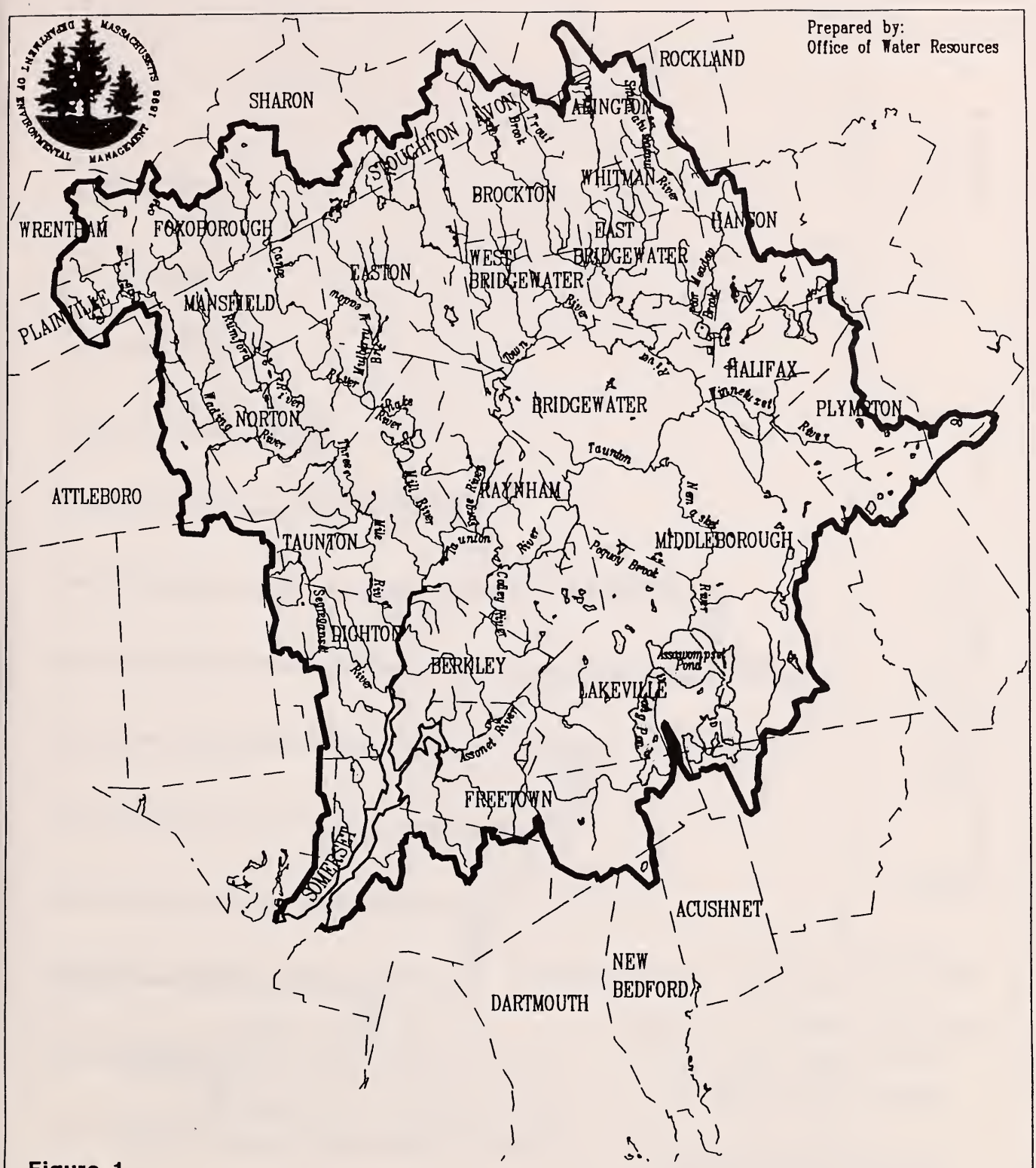
The Taunton River basin, one of the eleven basins in eastern Massachusetts discharging directly to the ocean, has a drainage area of 562 square miles and is located in southeastern Massachusetts (Figure 1). The Taunton River is formed by the confluence of the Matfield and Town Rivers in Bridgewater and follows a 36 mile course in a generally southern direction to Mt. Hope Bay. The river falls approximately 21 feet over its length. The basin has flat to low hilly topography typical of eastern Massachusetts basins shaped by glaciation. The basin contains over 94 square miles of wetlands, many lakes and ponds, and some of the most productive cranberry bogs in the country. The largest wetland area is Hockomock swamp which is 11.7 square miles and has been designated as an Area of Critical Environmental Concern.

The streamflow of the Taunton River is, on average, highest in March and lowest in August (Figure 2). Flows are measured continuously at three U.S. Geological Survey gages (Figure 3): the Wading River near Norton with a period of record from 1926, the Threemile River at North Dighton, from 1967, and the Segreganset River near Dighton, from 1967. The Taunton River was gaged at the State Farm site, near Bridgewater, from 1930 to 1975 and 1985 to 1988. The flows in the Taunton River fluctuate slowly due to the wetland areas, the stratified drift, and the flat gradient. The flows in the Segreganset River are weaker due to a lack of stratified drift, and the flows in the Wading River are weaker due to diversions. The Threemile River has been regulated in the past by use of the Norton Reservoir upstream, but is no longer significantly regulated.

The Taunton River basin is hydrologically strong in some areas and stressed in other areas. Similar to other eastern basins, much of the Taunton River is underlain by stratified drift (approximately 62 percent), providing sustained low flow to the river during the annual dry season. Some of the upper portions of the basin and some lower portions (approximately 38 percent) are underlain by till, which does not sustain flows in the many streams and rivers in these areas. Areas lacking in stratified drift are naturally weak, especially those in the headwaters of the Taunton River basin. The central and some lower portions of the Taunton River basin are strong relative to these areas. The northeastern portion of the basin which includes the Poor Meadow Brook, Town River, and Hockomock River are weak due to till deposits and historical water uses. The Threemile River into which the Wading and Rumford Rivers flow is generally strong. Historic industrial regulation, however, may have weakened the river during droughts. The Threemile River has actually improved as the regulation has been better managed.

The Taunton River is divided into 25 subbasins, one of which is tidal. A subbasin yield study of the Taunton River subbasins indicates that in 6 subbasins there would be no additional water available for water supply during a 1-in-20 year drought. It is estimated that current private and public water users, pumping at their present rates, would withdraw all of the water yield of those subbasins during the driest part of a drought. Limited additional water can be withdrawn from the stronger subbasins without significantly impacting the flow in the river.

The Taunton River basin's high spring flows are not presently affected by public water supply withdrawals. The large drainage area of the Taunton River basin provides for the high spring flows, and the wetland areas buffer the flood flows.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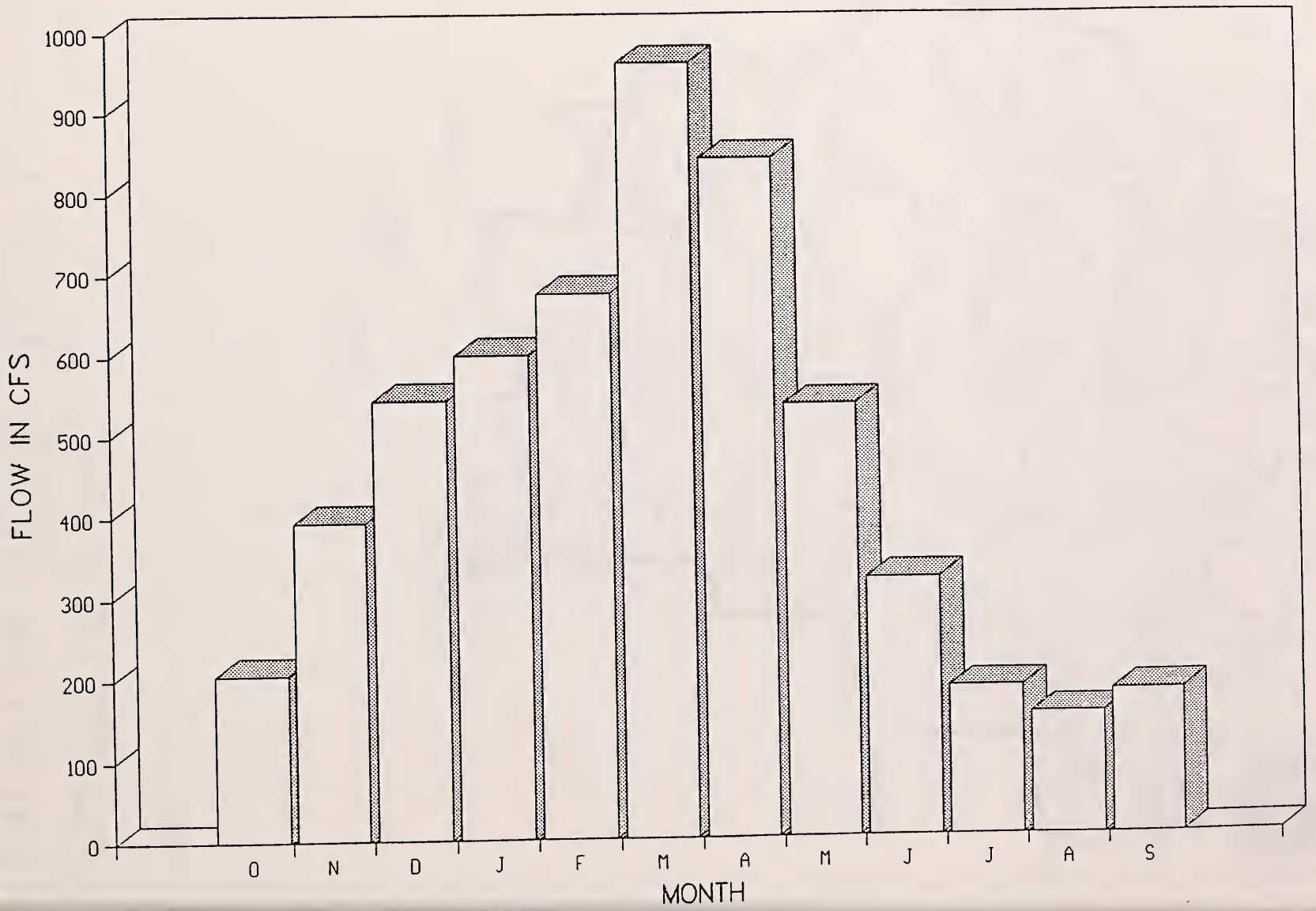
EASTON
MANSFIELD
PLAINVILLE
HALIFAX
BRIDGEWATER
PLYMPTON
NORTON
ATTLEBORO
RAYNHAM
TAUNTON
MIDDLEBOROUGH
DIGHTON
BERKLEY
LAKEVILLE
FREETOWN
SOMERSET
ACUSHNET
NEW BEDFORD
DARTMOUTH
Figure 1
River Basin Boundary
TAUNTON RIVER BASIN
0 5 10 miles
0 10 kilometers

TAUNTON RIVER MONTHLY FLOWS
PERIOD OF RECORD

Figure 2



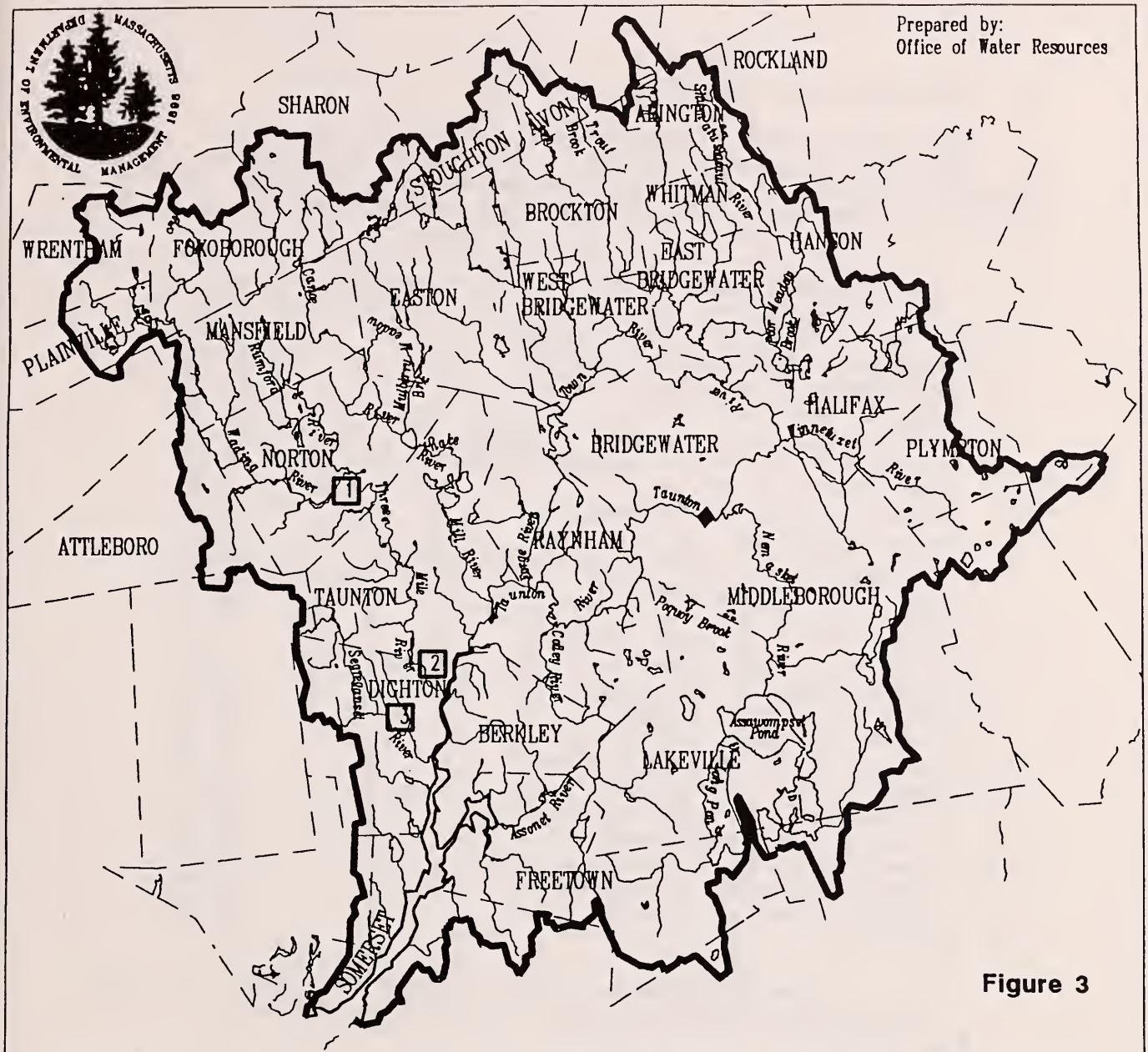


Figure 3

USGS Continuous Record Streamflow Gaging Stations

1. Gage no. 01109000, Wading River Near Norton. Period of Record–1925 to present.
2. Gage no. 01109060, Three Mile River at North Dighton. Period of Record–1966 to present.
3. Gage no. 01109070, Segreganset River Near Dighton. Period of Record–1966 to present.

◆ Discontinued Gage no. 01108000, Taunton River at State Farm, near Bridgewater. Period of record-1929 to 1976, discontinued. Reactivated 1985 and again discontinued in 1988.

River Basin Boundary

Source: U.S.G.S. Water Resources Data Report – MA and RI

0 5 10 miles

0 10 kilometers

TAUNTON RIVER BASIN

B. Taunton River Subbasins

The Taunton River basin is divided into 25 subbasins. (Figure 4) The flow in three of them is monitored by continuous record gaging stations and 19 others are measured by low-flow monitoring stations. The subbasins and their drainage areas* are as follows:

Subbasin Name	Drainage area (mi^2)
1. Nemasket River at Vaughn Street	49.80
2. Nemasket River near Middleboro	69.40
3. Winnetuxet River near Halifax	35.70
4. Robbins Pond Outlet	13.30
5. Poor Meadow Brook at South Hanson	14.60
6. Satucket River at East Bridgewater	34.80
7. Trout Brook at Brockton	5.89
8. Matfield River at Elmwood	40.50
9. Queset Brook at North Easton	7.49
10. Hockomock River near West Bridgewater	20.50
11. Town River at Bridgewater	55.60
12. Poquoy Brook near North Middleboro	8.23
13. Cotley Brook at East Taunton	7.53
14. Forge Brook near Taunton	9.23
15. Mulberry Meadow Brook near Norton	12.00
16. Canoe River near Norton	18.30
17. Mill River near Taunton	41.10
18. Rumford River at East Foxboro	5.09
19. Rumford River at Norton	20.70
20. Wading River at West Mansfield	19.50
21. Wading River near Norton	43.30
22. Threemile River at North Dighton	84.30
23. Segreganset River near Dighton	10.60
24. Assonet River at Assonet	20.70
25. Main Stem	144.31

* Many of the drainage areas are cumulative; that is, they include the drainage areas of upstream subbasins.

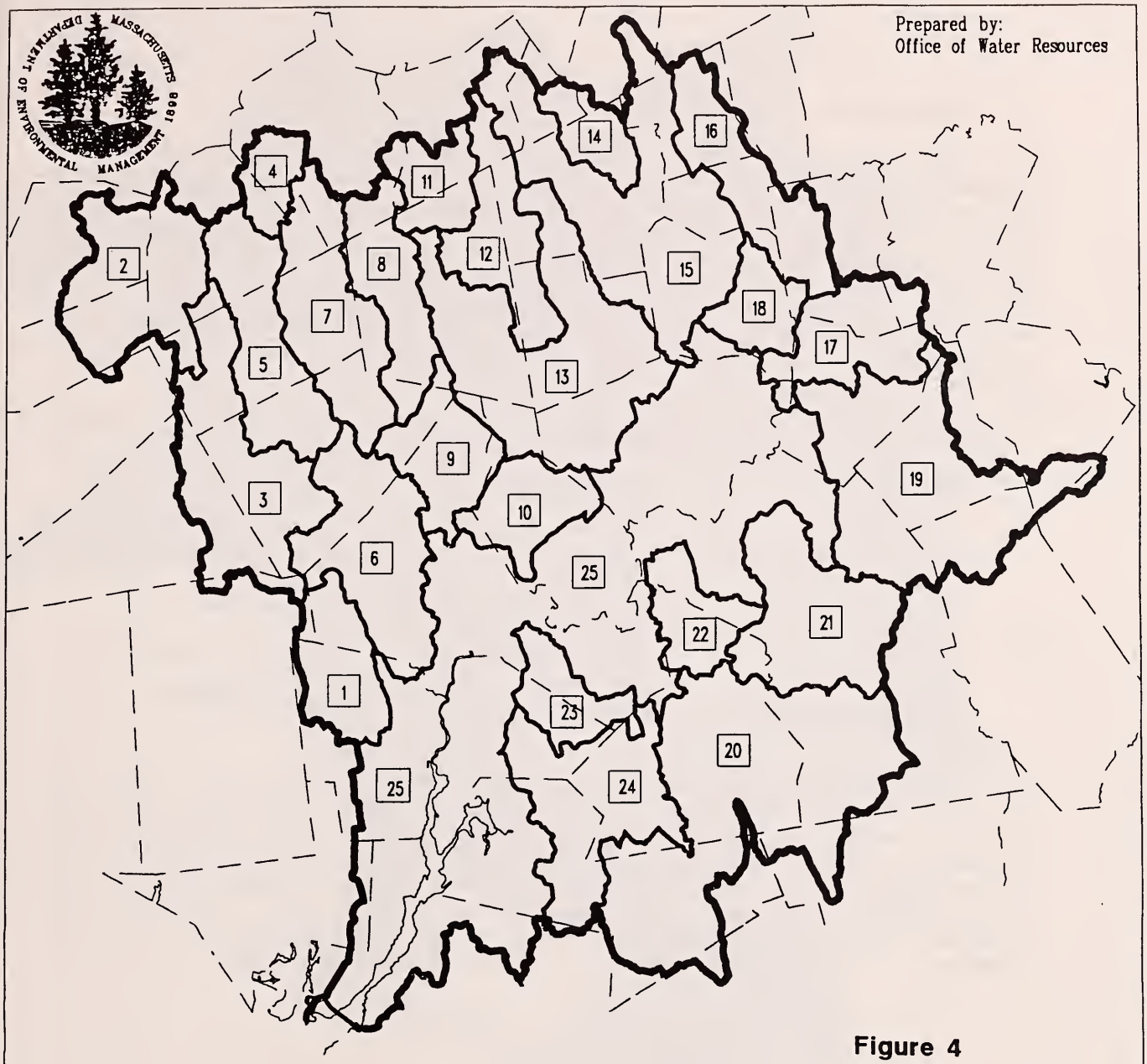


Figure 4

Taunton River Basin Subbasins

1. Segreganset River
2. Wading River (Mansfield)
3. Wading River (Norton)
4. Rumford River (Foxborough)
5. Rumford River (Norton)
6. Three Mile River
7. Canoe River
8. Mulberry Meadow Brook
9. Mill River
10. Forge River
11. Queset Brook
12. Hockomock River
13. Town River
14. Trout Brook
15. Matfield River
16. Poor Meadow Brook
17. Robins Pond Outlet
18. Satucket River
19. Winnetuxet River
20. Nemasket River (Vaughn St)
21. Nemasket River (Middleborough)
22. Poquoy Brook
23. Cotley Brook
24. Assonet River
25. Taunton River–Main Stem

TAUNTON RIVER BASIN

0 5 10 miles
0 10 kilometers

C. Study Area Description

The Taunton River basin study area includes thirty-one communities (Figure 5). Twenty-eight of these communities obtain all or part of their public water supplies from the Taunton River basin; Lakeville and Plympton are located within the basin boundary but have no public water supplies; and Rockland has a small amount of land area in the basin, but does not currently obtain any water from the basin. Twenty-nine study area communities are located entirely or partly in the Taunton River basin, while two are located almost entirely in the Buzzards Bay basin, but obtain water from the Taunton River basin.

The thirty-one communities in the study area are:

Abington	Foxborough	Plympton
Acushnet	Freetown	Raynham
Attleboro	Halifax	Rockland
Avon	Hanson	Sharon
Berkley	Lakeville	Somerset
Bridgewater	Mansfield	Stoughton
Brockton	Middleborough	Taunton
Dartmouth	New Bedford	West Bridgewater
Dighton	Norton	Whitman
East Bridgewater	Plainville	Wrentham
Easton		

Rockland is included in the study area because it is part of the Abington - Rockland Joint Water Works. Abington and its primary water source, the Myers Avenue Wells, are located in the Taunton River basin. Rockland and its primary source, the Hingham Street Reservoir, are located in the South Coastal basin. The Water Works also has rights to Sandy Bottom Pond in the South Coastal basin. This source is used to provide the balance of water needed to satisfy any remaining demand in either town.

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ROCKLAND
SHARON
ABINGTON
AVON
STOUGHTON
BROCKTON
WHITMAN
PEMBROKE
WRENTHAM
FOXOBOROUGH
HANSON
EASTON
EAST
BRIDGEWATER
WEST
BRIDGEWATER
MANSFIELD
PLAINVILLE
NORTH
ATTLEBORO
HALIFAX
KINGSTON
NORTON
BRIDGEWATER
PLYMPTON
ATTLEBORO
RAYNHAM
MIDDLEBOROUGH
TAUNTON
CARVER
REHOBOTH
DIGHTON
BERKLEY
LAKEVILLE
SWANSEA
SOMERSET
FREETOWN
ROCHESTER
FALL RIVER
ACUSHNET
NEW
BEDFORD
DARTMOUTH
STUDY AREA
COMMUNITIES
TAUNTON RIVER BASIN
0
5
10 miles
0
10 kilometers

Figure 5

D. Water Supply Sources

Ninety-two ground water sources supplied 27.80 mgd, or 41 percent of the water used by public water supply systems in the study area in 1986. Of these, 71 are located within the Taunton River basin and 21 are located in other basins (Ten Mile, Buzzards Bay, Narragansett Bay and Mt. Hope Bay Shores, Neponset, and Charles).

Thirteen surface water sources supplied 39.36 mgd or 59 percent of the water used by public water supply systems in the study area in 1986. Of these, nine are located within the Taunton basin and four are located in the South Coastal basin. The total volume of water withdrawn from sources in the Taunton River Basin was 48.02 mgd, or 72 percent of the total water demand of study area communities. Table 1 shows the percentage of water used from various basins by Taunton River basin communities. These percentages are expected to remain roughly the same throughout the planning period. (See Figure 14, page 27, for existing and proposed water supply sources)

Source of Supply 1986
Taunton River Basin Study Area
(in mgd)

Table 1

Community	Source of Water Supply							1986 ADD
	Taunton	South Coastal	Buzzards Bay	Ten Mile	Charles	Narragansett & Mt Hope Bays	Neponset	
Abington	0.61	0.52						1.13
Acushnet	0.38							0.38
Attleboro	1.57			3.57				5.14
Avon	0.50							0.50
Berkley								NA
Bridgewater	1.85							1.85
Brockton	2.97	7.65						10.62
Dartmouth	0.94		1.15					2.09
Dighton	0.75							0.75
East Bridgewater	0.89							0.89
Easton	1.49							1.49
Freetown	0.02							0.02
Foxborough	1.84						0.72	2.56
Halifax	0.43							0.43
Hanson	0.58	0.05						0.63
Lakeville	No Central System							
Mansfield	1.57			0.52				2.09
Middleborough	1.74							1.74
New Bedford	15.71							15.71
Norton	1.24							1.24
Plainville	0.36			0.17				0.53
Plympton	No Central Supply							
Raynham	0.69							0.69
Rockland		1.69						1.69
Sharon	0.47						0.74	1.21
Somerset	3.01					0.04		3.05
Stoughton	1.16						1.08	2.24
Taunton	5.74							5.74
West Bridgewater	0.75							0.75
Whitman	0.26	0.68						0.94
Wrentham	0.50				0.56			1.06
Total	48.02 72%	10.59 16%	1.15 2%	4.26 6%	0.56 <1%	0.04 <1%	2.54 4%	67.16 100%

E. Inventory of Instream Uses

An inventory of water uses in the Taunton River basin was conducted as part of the analysis of water resources and as a first step in developing a minimum streamflow threshold. The significant existing and planned river-dependent water uses in the Taunton River basin include fisheries, receipt of treated wastewater effluent, canoeing, hiking, swimming, public and private water supply, and wetlands. OWR coordinated the inventory of instream and out-of-stream flow needs, their locations, and instream flow needs relying upon data and estimated needs submitted by the respective Massachusetts State Agencies and other groups.

The suggested water needs are outlined below and shown on the maps that follow.

1. Resident Fisheries (Native and Stocked Trout Fisheries and warm water species) See Figure 6
   a. months of concern: Native Trout and warm water species - year round; Stocked Trout - March 15-June 15
   b. protection concerns: no new withdrawals from 3 tributaries with wild trout
   c. flow needs: 0.5 cfsm mainstem Taunton River; median monthly flows March 15-June 15 in stocked trout tributaries

2. Anadromous and Other Marine Fisheries (Alewife, Blueback herring, Rainbow smelt, White perch, American eel, Shellfish) See Figure 7
   a. months of concern: March - May, Mid-September - Mid-October
   b. protection concerns: adequate flows to permit diadromous fish migration in mainstem and tributaries; particularly concerned with location and season of withdrawals, e.g. out of basin transfers during September and October
   c. interim flow needs: 3.5 cfsm March, 3.0 cfsm April, 2.0 cfsm May

3. Receiving Treated Wastewater Effluent See Figure 8
   a. months of concern: year round
   b. protection concerns: adequate flow to meet DEP permit standards for wastewater dishcarge
   c. flow needs: The 7Q10 figure, obtained from USGS, is the lowest flow recurring on average every ten years for 7 consecutive days. DEP requires that discharges meet water quality standards at this flow. 7Q10 is 0.10 cfsm for the Taunton River and Threemile River, 0.05 cfsm for the Wading River and 0.0 cfsm for the Segreganset River.

4. Recreation (hiking) See Figure 9
   a. months of concern : hiking, year round
      : swimming, mainly summer
   b. protection concerns: scenic beauty for hiking, adequate

flows for swimming
c. flow needs: 0.20 - 0.50 cfsm, Taunton River; 0.20 - 1.20 cfsm 0.20-0.50 cfsm, tributaries

5. Forests and Parks (canoeing, fishing) See Figure 10
a. months of concern: same as recreation and fisheries
b. protection concerns: adequate flows to maintain flat water canoeing
c. flow needs: canoeing: 0.20 - 0.50 cfsm, Taunton River; 0.20 - 1.20 cfsm ; fisheries: 0.5 cfsm

6. Wetlands (over 60,000 acres) See Figure 11
a. months of concern: year round
b. protection concerns: spring floods in addition to year round flows to maintain wetlands vegetation
c. flow needs: no specific flow values currently known, but maintaining flows and seasonal variability is important to protecting water tables for wetlands, vernal pools, etc.

7. Scenic Rivers (Wampanoag Canoe Passage) See Figure 12
a. months of concern: April - October
b. protection concerns: adequate depths and velocities for flat water canoeing: maintaining natural aesthetic and recreational features of the river.
c. flow needs: 0.20 - 0.50 cfsm, Taunton River; 0.20 - 1.20 cfsm Satucket and Matfield Rivers

8. Hockomock Swamp Area of Critical Environmental Concern (fisheries, wildlife, boating, canoeing, swimming, birdwatching, hiking) See Figure 13
a. months of concern: year round
b. protection concerns: same as wetlands, fisheries and recreation
c. flow needs: same as wetlands, fisheries anmd recreation

9. Municipal Water Supply See Figure 14
a. months of concern: year round
b. protection concerns: sufficient flow to meet 2020 water supply needs, including conservation goals
c. flow needs: 0.08 - 0.12 cfsm; the flow that will allow municipalities to install new sources to meet future demands and withdraw continuously except for periods of no more than 10 consecutive days in a 1-in-20 year drought.

10. Agricultural Water Supply (cranberry bogs) See Figure 15
a. months of concern: year round
b. protection concerns: adequate water to permit self-supplied withdrawals for irrigation of approximately 2040 acres of cranberry bogs
c. flow needs: a minimum flow of 0.08 - 0.12 cfsm to accomodate 18.2 mgd withdrawal for irrigation

11. Industrial Water Supply (self-supplied) See Figure 16
    a. months of concern: year round
    b. protection concerns: adequate water for industrial use
    c. flow needs: 0.08 - 0.12 cfsm; the flow that will allow them to install new sources to meet future demands and withdraw continuously without restraint except for periods of no more than 10 consecutive days in a 1-in-20 year drought

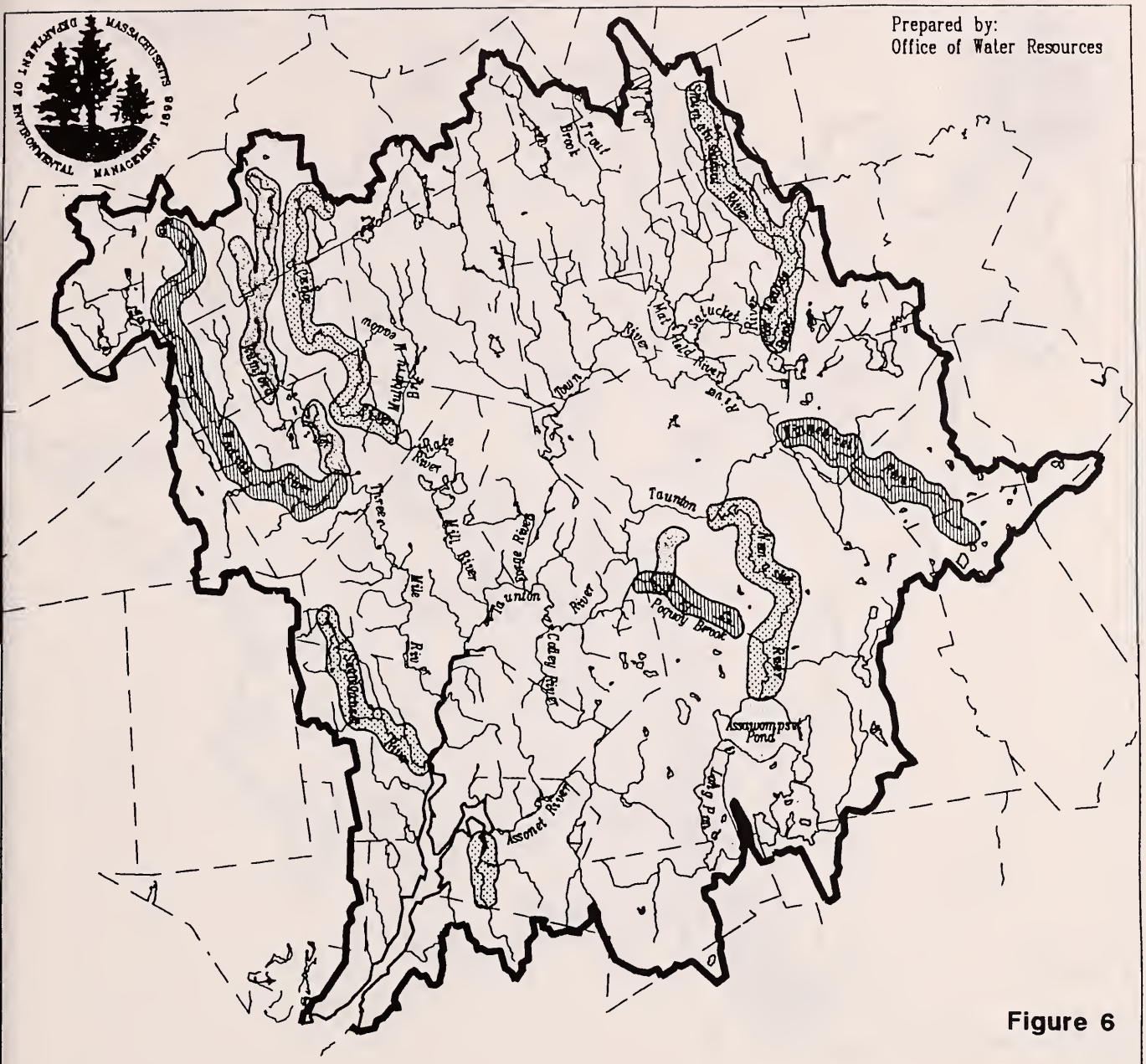


Figure 6

Resident Fisheries

Division of Fisheries and Wildlife

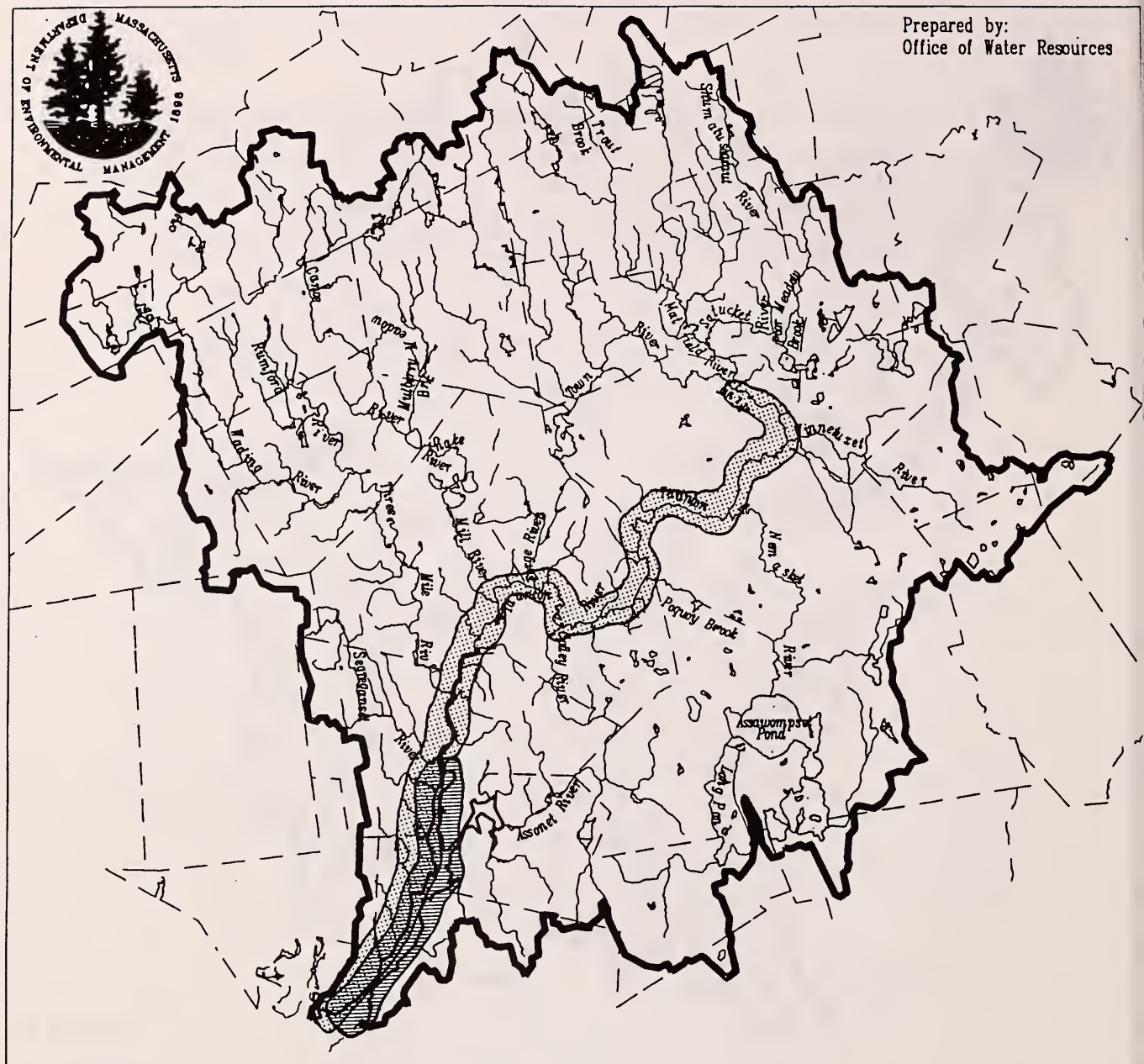


Figure 7

Marine Fisheries

Division of Marine Fisheries

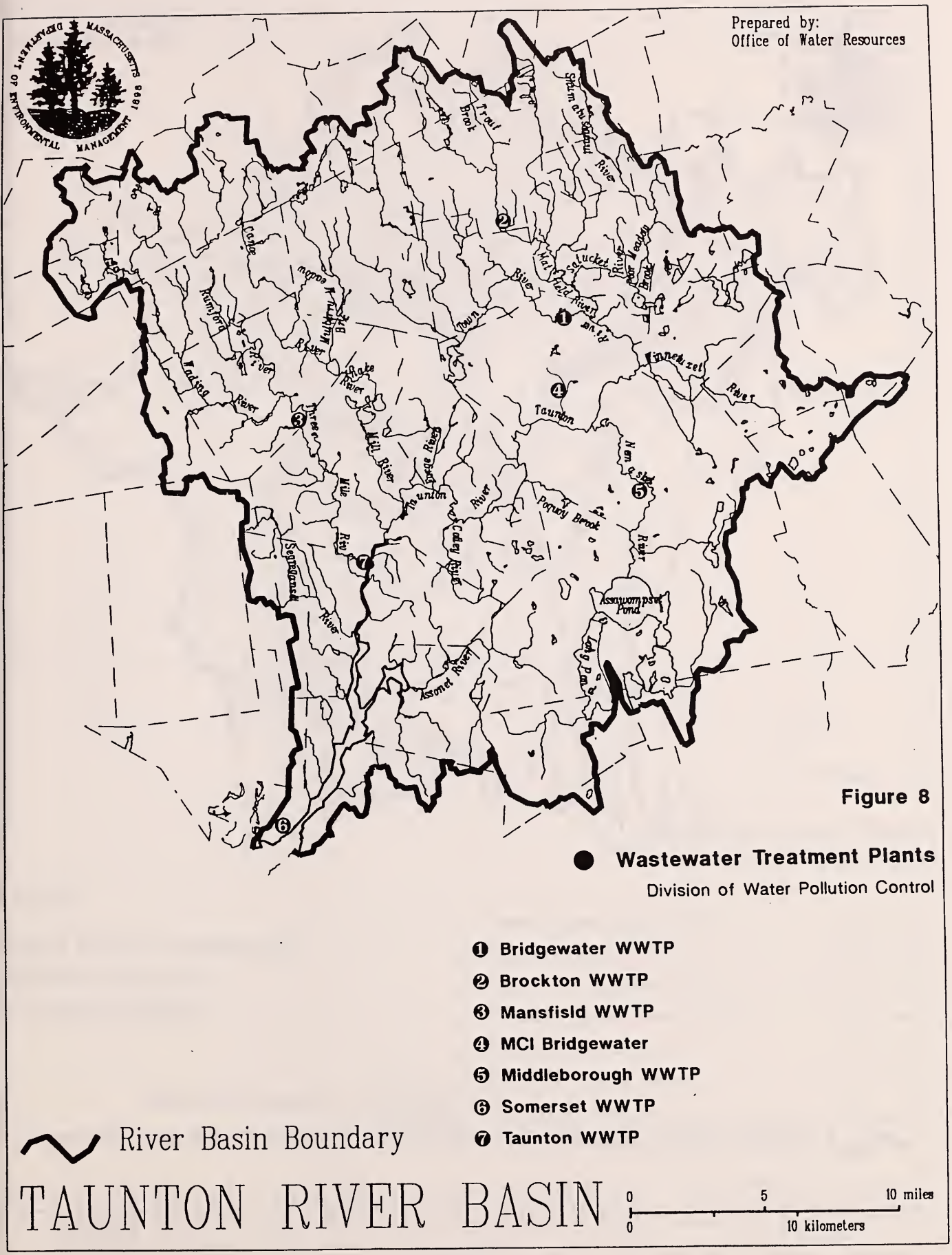


Figure 8

● **Wastewater Treatment Plants**

Division of Water Pollution Control

1. **Bridgewater WWTP**
2. **Brockton WWTP**
3. **Mansfisld WWTP**
4. **MCI Bridgewater**
5. **Middleborough WWTP**
6. **Somerset WWTP**
7. **Taunton WWTP**

River Basin Boundary

TAUNTON RIVER BASIN

0 5 10 miles

0 10 kilometers

Figure 9

Recreation (Canoeing, Boating)

Conservation Commissions

Appalachian Mountain Club

River Basin Boundary

Canoeing with Rapids

Flatwater Canoeing and Boating

TAUNTON RIVER BASIN

0 5 10 miles

0 10 kilometers

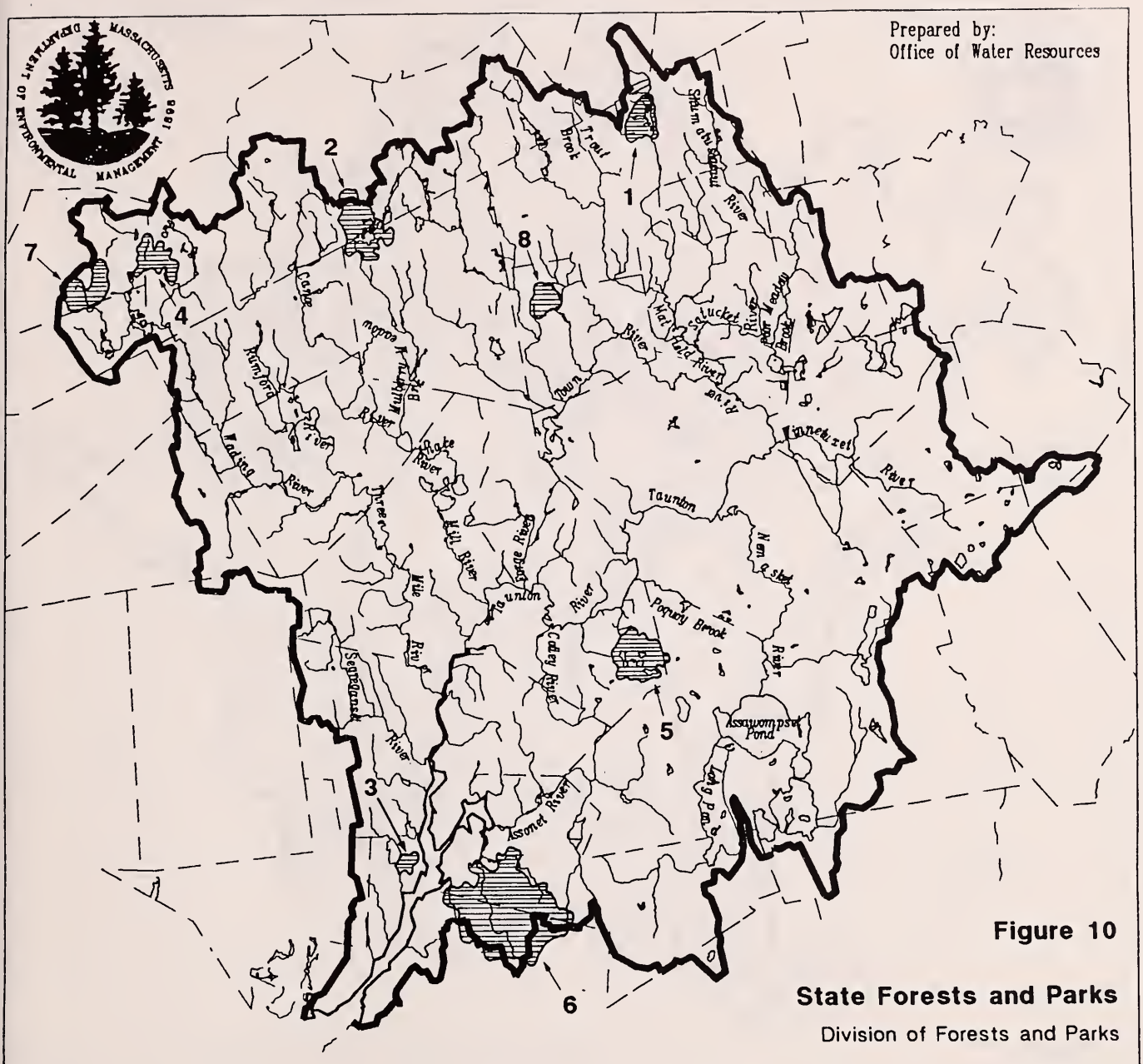


Figure 10

State Forests and Parks

Division of Forests and Parks

1. **Ames Nowell State Park** _ _ _ _ _ _ _ 600 acres
2. **Borderland State Park** _ _ _ _ _ _ _ 1600 acres
3. **Dighton Rock State Park** _ _ _ _ _ _ _ 85 acres
4. **F. Gilbert Hills State Forest** _ _ _ _ _ 982 acres
5. **Massasoit State Park** _ _ _ _ _ _ _ 1500 acres
6. **Freetown State Forest** _ _ _ _ _ _ _ 5441 acres
7. **Wrentham State Forest** _ _ _ _ _ _ _ 900 acres
8. **West Bridgewater State Forest** _ _ _ _ 252 acres

River Basin Boundary

TAUNTON RIVER BASIN

0 5 10 miles
0 10 kilometers

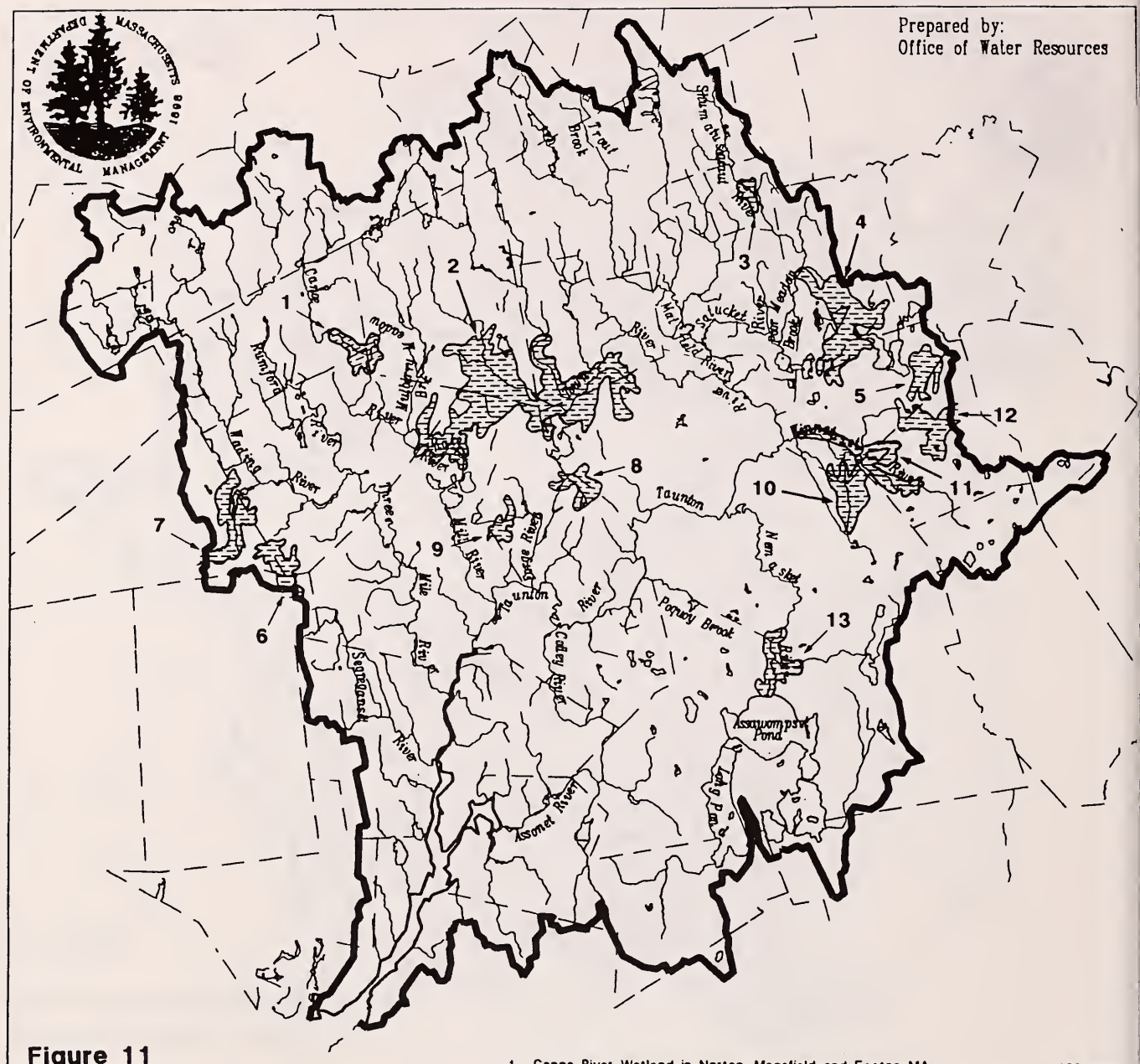


Figure 11

Significant Wetland Areas

U. S. Dept of Agriculture;

Water Resources Commission

1. Canoe River Wetland in Norton, Mansfield and Easton MA ------- 190 acras
2. Hockomock Swanp in Easton, W. Bridgawatar, Taunton and Raynham --- 5450 acres
3. Baar Meadow Watland in Whitman ---------- 130 acras
4. Great Cedar Swamp in Halifax and Hanson ---------- 1470 acres
5. Petarson Swam in Halifax and Plympton ---------- 410 acres
6. Hamlock Swamp in Rehoboth, Attlaboro and Norton ---------- 790 acres
7. Chartley Brook Watland in Atlaboro and Norton ---------- 600 acres
8. Titicut Swamp in Bridgawatar and Raynham ---------- 430 acras
9. Pine Swamp in Raynham and Taunton ---------- 540 acres
10. Great Cadar Swamp in Middlaborough and Halifax ---------- 720 acres
11. Winnetuxet River Wetland in Halifax and Plympton ---------- 710 acres
12. Turkay Swamp in Halifax and Plympton ---------- 850 acres
13. Namasket Rivar Watland in Middleborough and Lakaville ------- 490 acres

River Basin Boundary

TAUNTON RIVER BASIN

0 5 10 miles

0 10 kilometers

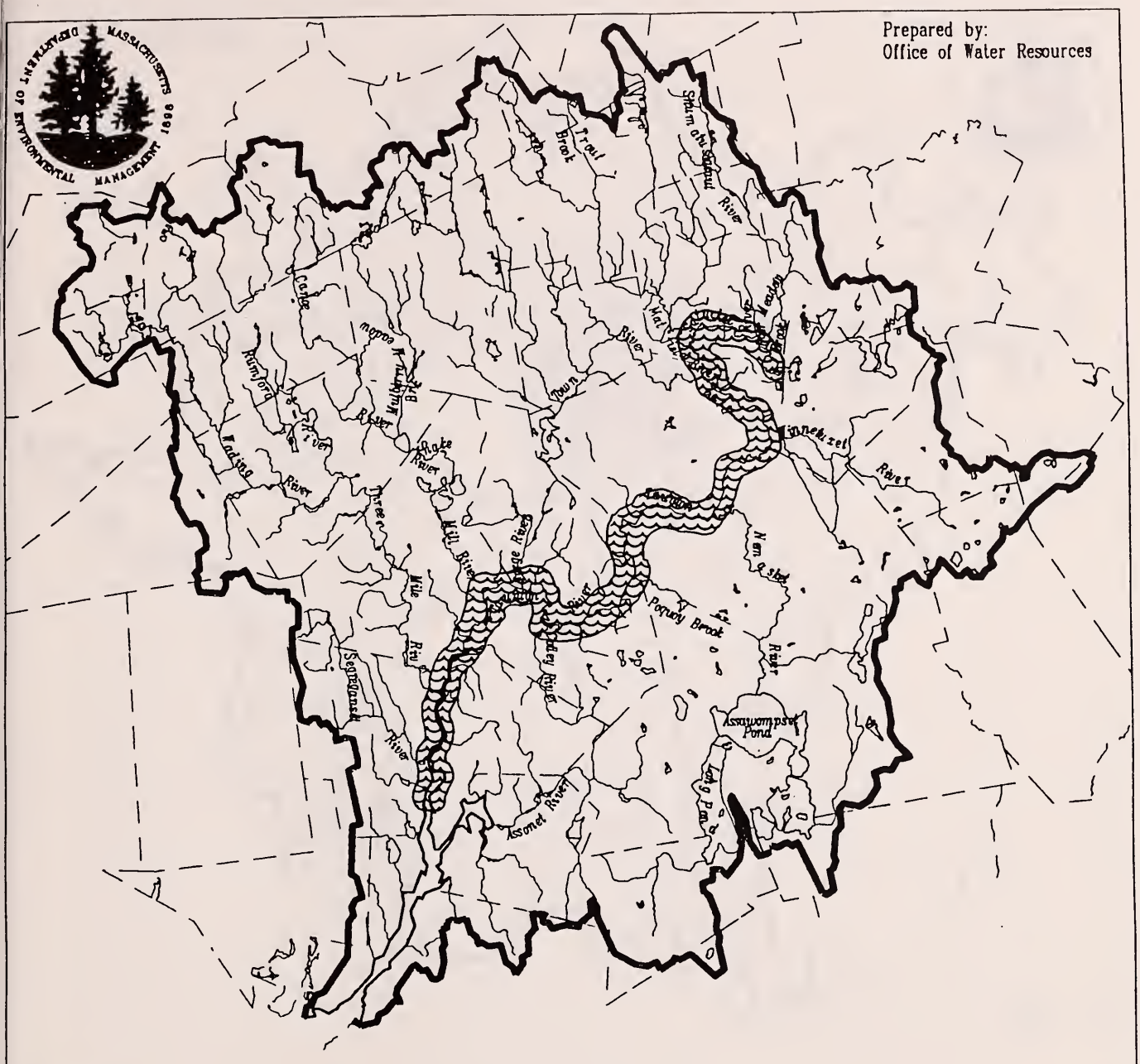


Figure 12

Scenic Rivers

Division of Resource Conservation

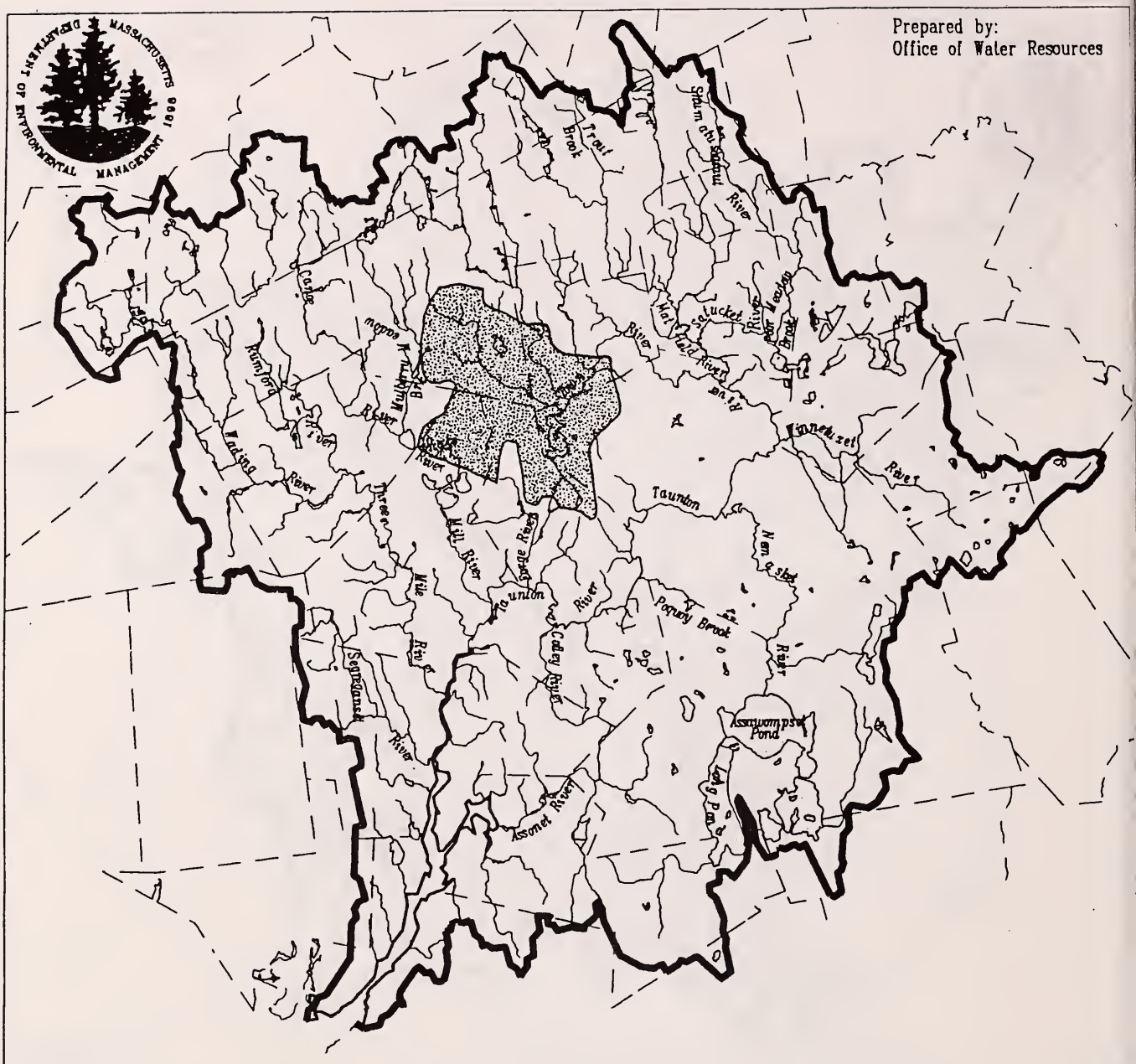


Figure 13

Inland ACEC

(Area of Critical Environmental Concern)

Division of Resource Conservation

River Basin Boundary

Hockomock Swamp ACEC

TAUNTON RIVER BASIN

0 5 10 miles

0 10 kilometers

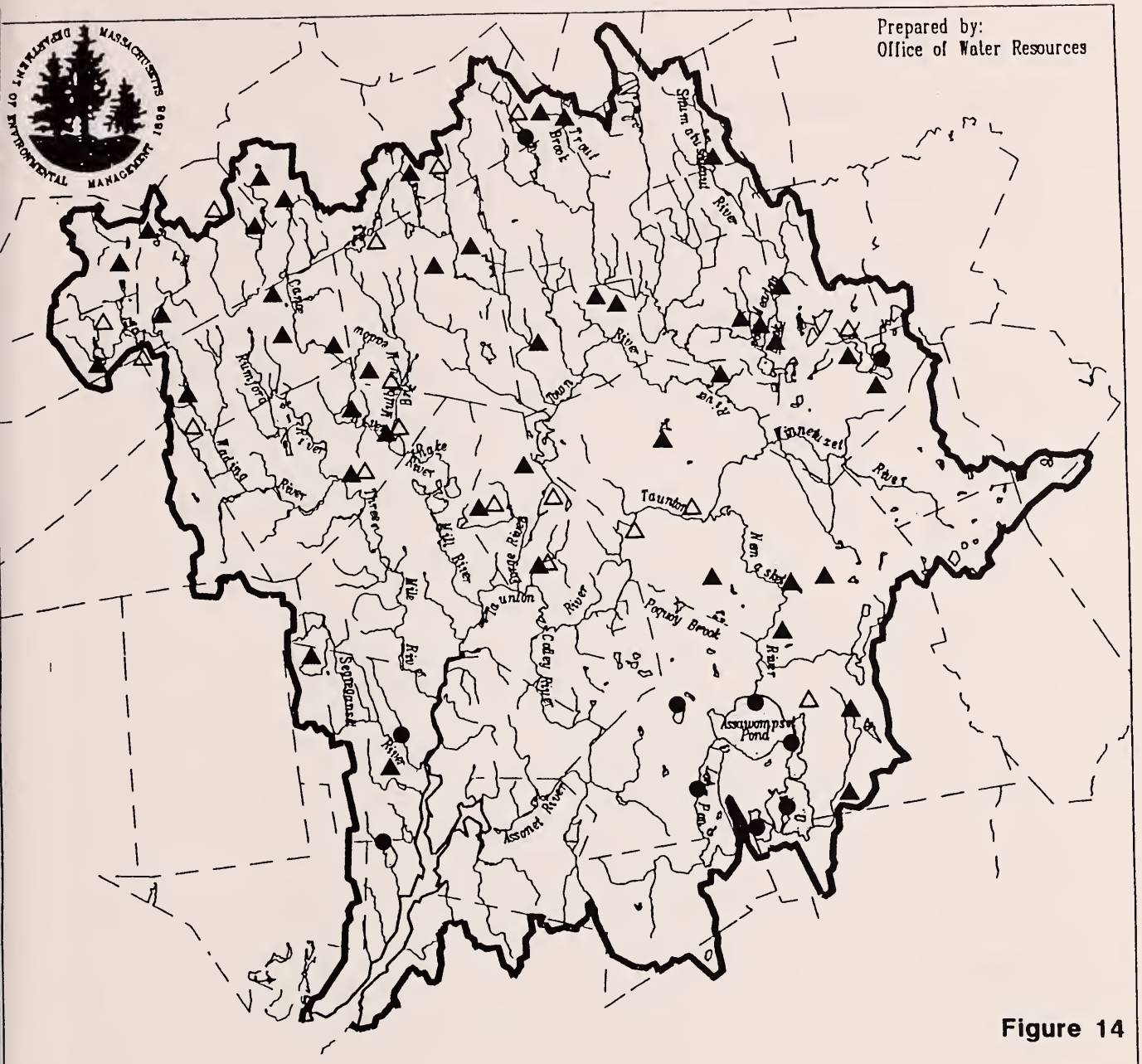


Figure 14

Taunton River Basin Municipal Water Supply Sources

△ **Proposed Source**

▲ **Ground Water Source**

● **Surface Water Source**

River Basin Boundary

TAUNTON RIVER BASIN

0 5 10 miles

0 10 kilometers

figure 15 Cranberry bogs

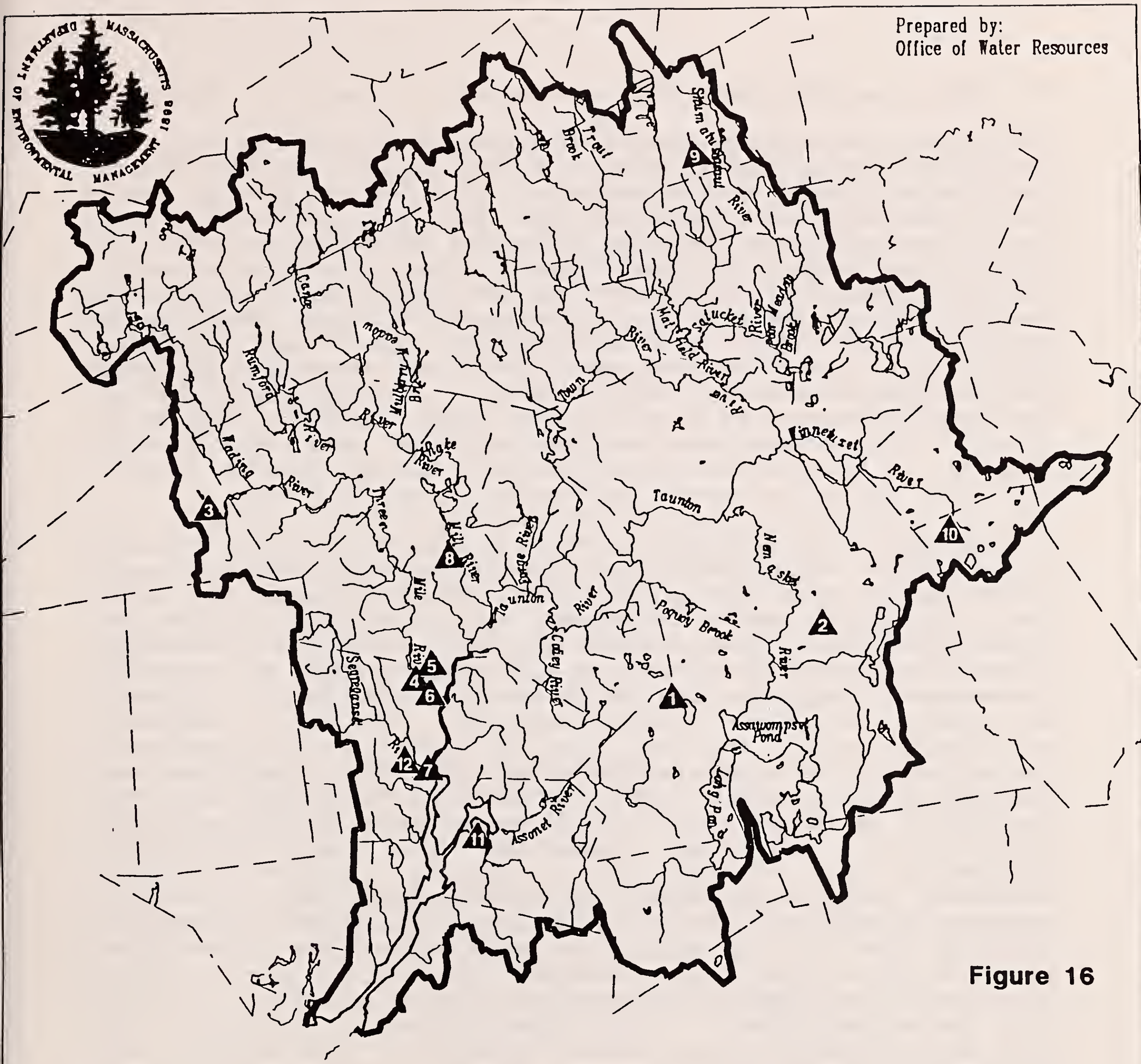


Figure 16

SELF-SUPPLIED INDUSTRIAL WATER USE

1. Lakeville Sand and Gravel
2. Byrne Sand and Gravel
3. Texas Instruments
4. Rosemar Silver
5. Harodite Finishing
6. G.A. Rogers (Princess House)
7. ICI Americas
8. Reed and Barton
9. Robertson Brothers (WR Grace)
10. Nemasket Sand and Gravel
11. Com/Energy Freetown Realty Trust
12. P. Bradshaw Corp.

River Basin Boundary

TAUNTON RIVER BASIN

0 5 10 miles
0 10 kilometers

F. Water Quality Conditions and Trends

The Taunton River watershed has a myriad of tributaries and sub-tributary systems that contribute to the flow of the main stem of the Taunton River. At the headwaters of the basin, the Salisbury Plain and Satucket Rivers are the main contributors to the Matfield River while Coweeset and Queset Brooks are tributaries to the Town River. This portion of the basin is referred to as the Upper Taunton River section. In the eastern portion or Lower Taunton River section, the Winnetuxet, Nemasket and Assonet Rivers are the major sources of flow to the river, while the Mill, Three Mile and Segreganset Rivers are the major drainage areas in the western portion of the basin, often referred to as the Rumford/Three Mile section. The river is fairly uniform in width in its freshwater portion and then broadens into an estuary. Salt water intrusion occurs upstream to river mile 12 and tidal influence occurs upstream to river mile 19.

The waters of the Taunton River Basin have been historically subjected to significant inputs of wastewater discharges and, consequently, have demonstrated serious water quality problems. There are 23 major industrial and municipal wastewater dischargers that have NPDES (National Pollutant Discharge Elimination System) permits in the Taunton River Basin. Seven of these are municipal wastewater treatment plants (WWTP) located in Bridgewater, Brockton, Taunton, Mansfield, Fall River, Somerset, and Middleborough. Over the past ten years pollution abatement projects have been completed, and these municipal facilities were upgraded and expanded. Also, industrial discharges received treatment or have tied into municipal facilities with pretreatment, and some discharges have been eliminated completely, often by going out of business. Current pollution abatement projects underway are the construction of lateral sewers and interceptors to alleviate water quality problems stemming from failing subsurface disposal systems. The three main sections within the Taunton River Basin each receive wastewater discharges and have water quality problems associated with these discharges. In the upper portion of the basin, the Town and Matfield Rivers receive discharges from Brockton and Bridgewater wastewater treatment plants. These rivers have historically been subjected to severe oxygen depletion, periodic bacterial contamination, heavy metal inputs and accelerated eutrophication. Upgrading and expanding of the Brockton WWTP to advanced wastewater treatment improved water quality conditions in both the Matfield and Salisbury Plain Rivers.

A pollution abatement project in the Upper Taunton River section included the town of Whitman's construction of an interceptor and lateral sewer tie-in to the Brockton WWTP. Upon completion in late 1987, water quality problems from failing septic systems were eliminated in the areas of the Shumatuscacant River and Meadow Brook. The Bridgewater WWTP was upgraded to advanced

wastewater treatment, with completion of the project in 1989.

The lower portion of the basin receives discharges within the city of Taunton. These include numerous industrial discharges, primarily plating operations, and the Taunton WWTP discharge to the Taunton River. In 1978, the Taunton WWTP was upgraded to an 8.4 MGD pure oxygen, activated sludge, advanced wastewater treatment system. Some industrial discharges have been eliminated by being tied into the Taunton WWTP with pretreatment. Survey data showed improvement in dissolved oxygen levels downstream due to the combined effect of reduction in organic loadings and the nitrification process at the Taunton WWTP. Significant improvements in water quality have been observed in the Nemasket River. This can be attributed to upgrading the Middleborough WWTP to advanced treatment, which produces an effluent with an extremely low oxygen demand.

The third area of the Taunton River Basin is the Rumford/Three Mile section. The Mansfield WWTP, up until the summer of 1985, discharged to Back Bay Brook, a tributary to the Norton Reservoir. This discharge created severe water quality problems and added nutrients to the reservoir, which accelerated its eutrophication. During the summer of 1985, the Mansfield WWTP discharge was relocated to the Three Mile River below Norton Reservoir. This facility provides for advanced wastewater treatment.

The expansion of the Mansfield WWTP provided for flows from Foxborough within the Robinson Brook area. The completed interceptor and lateral sewers eliminated Foxborough's discharge to Robinson Brook.

In summary, the water quality of the Taunton River and its tributaries, which was poor for decades, has been improved significantly in the past decade.

(This section courtesy of DEP/DWPC)

Fig 17

map to follow in final report

Table 2

Data to follow in final report

A. Water Demand Projections

The base average day water demand (ADD) for public water suppliers in the Taunton River study area was 72 million gallons per day (mgd). Base water demand is the average of of the demand for the years 1987, 1988, and 1989. OWR projects that average day demand will increase to 89 mgd by 2010 due to projected population increase, increase in industrial and commercial water use, increase in GPCD, and increases in service population (Table 3).

The change in the gallons per capita day usage in the Taunton River basin from 1980 to 1988 has been analyzed by OWR. These years were selected because they are the most recent years for which we have both reliable population and water use data. Two of the 31 water suppliers in the basin were eliminated from the sample because there was not data available for them during this time period. These water suppliers are the Berkley Water Commission, which was not in existence in 1980, and the Freetown Water Commission, which did not file a Water Supply Statistics Sheet with DEP in 1988. Both of these Water Commissions serve only a small portion of their respective towns and use, on an average, less than 0.01 mgd annually.

Table 4 presents service population, ADD and GPCD for Taunton River study area communities for the years 1980 and 1988, as well as the percent changes for this time period. Basin-wide, GPCD increased 3.58% during this time period. This table shows that of the 29 water suppliers in the sample, seven experienced decreases in GPCD, 19 experienced increases in GPCD of greater than five percent, and 3 experienced increases in GPCD of less than five percent. Figure 18 presents GPCD changes in descending order.

The reasons for increases and decreases in GPCD are varied. For instance, Rockland, with a 38% increase in GPCD had a relatively stable population during this time period. However, two large hotels, which obtain water from the Abington - Rockland Joint Water Works, were constructed. Avon, with a GPCD increase of 21%, also had a relatively stable population, but has experienced increased industrial water use. On the other hand, Brockton, with similar population trends, has been under a water emergency for several years and has imposed a building moratorium. As part of this emergency, Brockton has been practicing conservation and has imposed water use restrictions. This has resulted in a five percent decrease in its GPCD.

It is recommended that each community implement a water conservation program to modify the projected increase in demand.

Table 3

Revised Water Demand Projections
Taunton River Basin Study Area
1987-1989 to 2010

COMMUNITY	1987 to 1989 BASE ADD	PROJECTIONS 1995 ADD	PROJECTIONS 2000 ADD	PROJECTIONS 2010 ADD	CHANGE IN DEMAND (MGD) BASE TO 2010	PERCENT CHANGE BASE TO 2010
Abington	1.37	1.39	1.43	1.60	0.23	16%
Acushnet	0.50	0.55	0.62	0.67	0.17	34%
Attleboro	5.27	5.48	5.81	5.97	0.70	13%
Avon	0.45	0.55	0.56	0.61	0.16	37%
Berkley	0.00	0.01	0.01	0.01	0.01	195%
Bridgewater	1.82	1.91	2.06	2.40	0.58	32%
Brockton	11.64	11.47	11.65	13.70	2.06	18%
Dartmouth	2.13	2.37	2.57	2.95	0.81	38%
Dighton						
N. Dighton FD	0.15	0.16	0.17	0.17	0.02	16%
Dighton WD	0.69	0.78	0.88	0.88	0.19	27%
E. Bridgewater	1.05	1.08	1.13	1.21	0.16	15%
Easton	1.58	1.67	1.75	2.34	0.76	48%
Foxborough	2.47	2.50	2.58	2.67	0.19	8%
Freetown	0.01	0.01	0.02	0.02	0.00	24%
Halifax	0.49	0.52	0.56	0.66	0.17	34%
Hanson	0.72	0.76	0.79	0.90	0.18	25%
Lakeville						
Mansfield	2.12	2.20	2.32	2.52	0.40	19%
Middleborough	1.82	2.25	2.42	3.03	1.21	66%
New Bedford	17.47	18.17	19.21	19.58	2.11	12%
Norton	1.29	1.45	1.55	1.85	0.56	43%
Plainville	0.53	0.58	0.62	0.58	0.05	9%
Plympton						
Raynham						
N. Raynham	0.32	0.86	0.88	0.90	0.58	179%
Raynham Center	0.74	1.08	1.13	1.20	0.46	62%
Rockland	2.03	2.08	2.18	2.21	0.18	9%
Sharon	1.54	1.60	1.69	1.62	0.08	5%
Somerset	3.02	3.71	3.91	4.42	1.40	47%
Stoughton	2.26	2.26	2.32	2.41	0.15	7%
Taunton	5.82	6.29	6.72	8.41	2.59	44%
W. Bridgewater	0.85	0.88	0.92	1.53	0.67	79%
Whitman	0.96	0.97	0.99	1.13	0.18	19%
Wrentham	1.19	1.26	1.43	1.32	0.13	11%
TOTALS	72.31	76.83	80.88	89.45	17.13	24%

Changes in Gallons per Capita per Day
Taunton River Basin 1980 – 1988

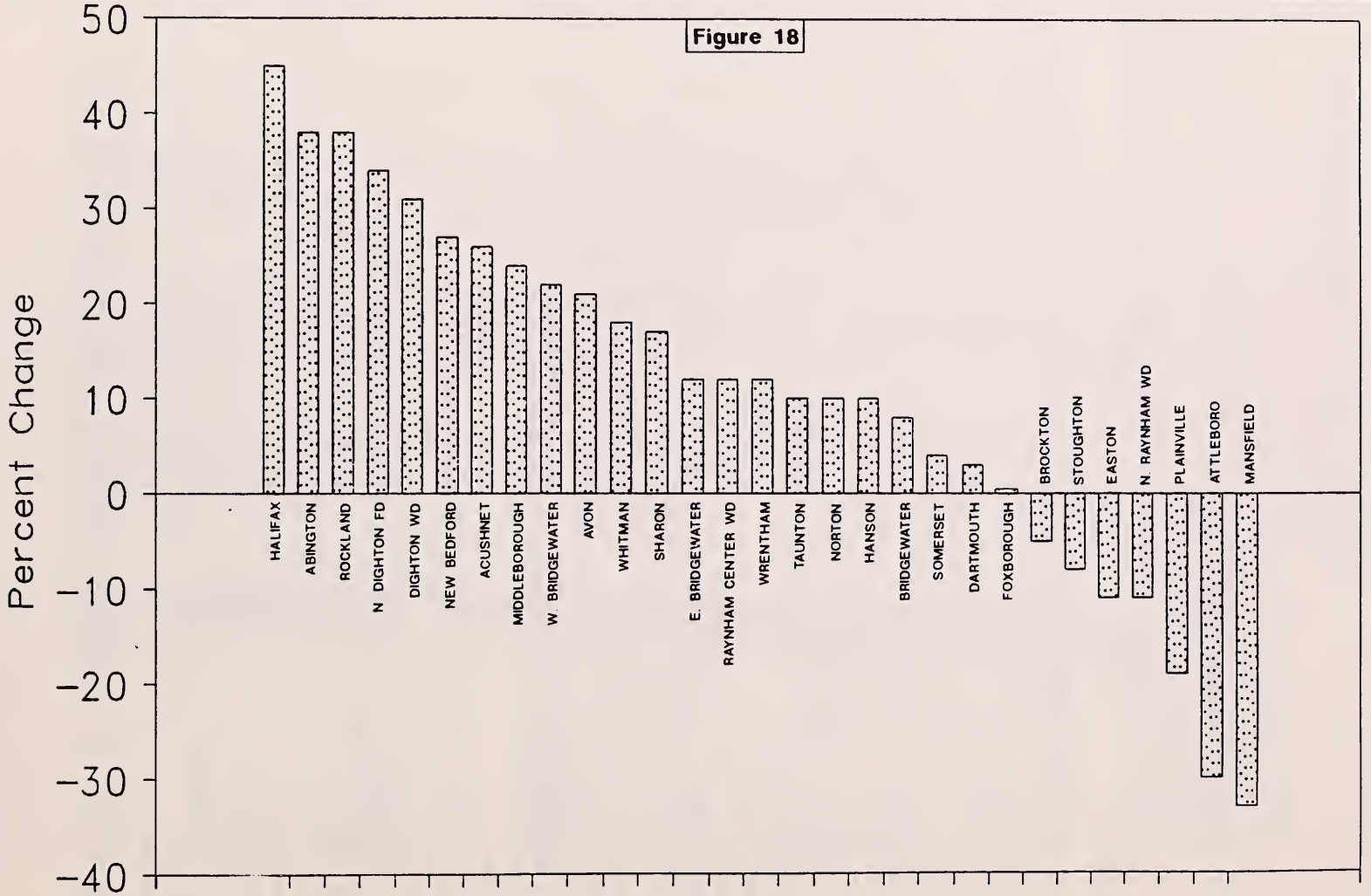


Table 4

GALLONS PER CAPITA DAY CHANGES
TAUNTON RIVER BASIN
1980 TO 1988

COMMUNITY	1980 FEDERAL CENSUS	1980 SERVICE POPULATION	1980 ADD	1980 GPCD	1988 CENSUS ESTIMATE	1988 SERVICE POPULATION	1988 ADD	1988 GPCD	PERCENT GPCD CHANGE 1980 TO 1988
Abington	13,517	13,382	1.02	76	13,810	13,810	1.45	105	37.75%
Acushnet	8,704	6,528	0.40	61	8,970	6,728	0.52	77	26.14%
Attleboro	34,196	34,196	7.53	220	35,440	35,440	5.50	155	-29.52%
Avon	5,026	5,026	0.40	80	4,770	4,770	0.46	96	21.17%
Berkley	2,731	0	--		4,060	81	<0.01	0	
Bridgewater	17,202	16,686	1.47	88	19,250	18,673	1.77	95	7.60%
Brockton	95,172	95,172	12.99	136	92,410	92,410	11.98	130	-5.02%
Dartmouth	23,966	22,768	2.01	88	25,670	23,103	2.11	91	3.45%
Dighton	5,352				5,460				
N.Dighton FD		963	0.11	114		983	0.15	153	33.67%
Dighton WD		3,479	0.48	138		3,658	0.66	180	30.76%
E.Bridgewater	9,945	9,945	0.88	88	10,640	10,640	1.05	99	11.52%
Easton	16,623	16,124	1.58	98	18,870	18,304	1.60	87	-10.79%
Foxborough	14,148	14,148	2.36	167	14,870	14,870	2.49	167	0.39%
Freetown	7,058	423	0.02	47	8,190	491	<0.01	0	
Halifax	5,513	4,741	0.27	57	6,500	6,045	0.50	83	45.24%
Hanson	8,617	8,531	0.58	68	9,320	9,134	0.68	74	9.50%
Lakeville	5,931				7,980				
Mansfield	13,453	13,184	2.64	200	15,600	15,288	2.05	134	-33.04%
Middleborough	16,404	13,943	1.38	99	17,640	14,994	1.84	123	23.99%
New Bedford	98,478	98,478	13.60	138	94,330	94,330	16.54	175	26.97%
Norton	12,690	11,421	1.15	101	13,860	12,474	1.38	111	9.87%
Plainville	5,857	4,393	0.57	130	6,340	4,755	0.50	105	-18.96%
Plympton	1,974				2,340				
Raynham	9,085				9,640				
N.Raynham		2,544	0.27	106		3,181	0.30	94	-11.15%
Raynham Center		4,543	0.50	110		5,784	0.71	123	11.52%
Rockland	15,695	15,538	1.53	98	15,560	15,560	2.11	136	37.71%
Sharon	13,601	13,329	1.26	95	15,370	15,063	1.66	110	16.58%
Somerset	18,813	18,813	3.04	162	17,690	17,690	2.97	168	3.90%
Stoughton	26,710	26,443	2.40	91	27,690	26,859	2.24	83	-8.11%
Taunton	45,001	45,001	5.38	120	45,980	45,980	6.06	132	10.24%
W.Bridgewater	6,359	6,359	0.69	109	6,560	6,560	0.87	133	22.22%
Whitman	13,534	13,399	0.79	59	13,320	13,307	0.93	70	18.54%
Wrentham	7,580	5,837	0.82	140	8,940	7,599	1.19	157	11.46%
TOTAL	578,935	545,336	68.12	125	597,070	558,563	72.27	129	3.58%

B. Analysis of Water Resources and Water Uses

This section presents the results of OWR's analysis of the hydrologic ability of the Taunton River basin to meet all current and projected water uses. The instream and out-of-stream water uses and locations were identified, and the availability of the river basin flows to adequately provide for uses in a selected drought condition was analyzed.

The basin plan focuses on twenty-five subbasins which comprise the Taunton River basin (Figure 4, page 11). The subbasins are defined by the major tributary brooks entering the main stem of the river. The analysis was conducted on the subbasins of the Taunton River basin utilizing the OWR Subbasin Yield (SUBY) Methodology. Subbasin yield is an expression of how much water is available within a subbasin prior to consideration of a minimum streamflow threshold or the impact of regulation. The analysis examines subbasin yields which are available 95 percent of the time during a repeat of the 1980-1981 drought conditions. The hydrologic conditions of the 1980-1981 drought were selected to test the reliability of water supply systems that depend on the water resources of the Taunton River basin and because of the importance of drought periods for ecological systems. The 1980-1981 drought is referred to as the planning drought.

Following the initial SUBY analysis, natural subbasin yields were adjusted to reflect the effects of existing regulation in order to determine available yields for future water uses and for establishing a minimum streamflow threshold (Table 5). This adjustment involved calculating the effect of subbasin inflow/outflow on unregulated streamflow yields. A summary of Taunton Inflow/Outflow is shown in Figure 19. Subbasin inflow is the volume of water a subbasin gains as a result of public water supply/wastewater transfer from another subbasin. Subbasin outflow is the volume of water a subbasin loses as a result of public water supply/wastewater transfer to another subbasin. More water is currently being withdrawn than is available during the planning drought in three of the nine subbasins.

The results presented in Table 5 show that no additional water is available in six subbasins five percent of the time during the 1980-1981 drought. Wells developed in these subbasins would not be reliable during a repeat of the 1980-1981 hydrologic conditions.

An important goal of the basin plan is to anticipate problems which may occur when water resources are limited by droughts and to recommend alternatives to meet projected needs. To this end, each community's water supply system has been tested by analyzing its success or failure to meet 2020 water demand with a repeat of the 1980-1981 drought conditions.

Table 5
Subbasin Yields and
Human Influence on Subbasin Hydrology
Taunton River Basin

Subbasin	Cumulative 95% Flow Duration (cfs)	Cumulative Inflow/Outflow (cfs)	Resultant Potential Yield (mgd)
Nemasket River (Vaughn St)	3.23	-39.29**	**
Nemasket River (Middleboro)	5.94	-38.17**	**
Winnetuxet River	2.88	-0.26	1.69
Robins Pond Outlet	0.59	-0.77**	**
Poor Meadow Brook	0.74	0.49	0.79
Satucket River	5.60 *	-1.81	2.41
Trout Brook	0.25	-0.28	0.00
Matfield River	3.18	20.41	15.24
Queset Brook	0.42	-1.13	0.00
Hockomock River	1.69	-2.24	0.00
Town River	6.63	-0.48	3.97
Poquouy Brook	0.36	0.29	0.42
Cotley Brook	0.36	0.37	0.47
Forge River	1.70 *	0.20	1.22
Mulberry Meadow Brook	1.03	0.59	1.04
Canoe River	2.50 *	-4.15	0.00
Mill River	7.10 *	-2.86	2.73
Rumford River (E. Foxboro)	0.80 *	-0.94	0.00
Rumford River (Norton)	2.60 *	2.77	3.46
Wading River (Mansfield)	1.59	-3.17	0.00
Wading River (Norton)	5.25	0.14	3.48
Three Mile River	13.20	5.19	11.87
Segreganset River	0.42	-0.15	0.17
Assonet River	1.24	0.09	0.86

* Derived from Aquifer Yield Methodology

** Resultant potential yields may be unaffected by cumulative outflows due to large surface water storage bodies located in the subbasin

Prepared by:
Office of Water Resources
-33.1 mgd outflow to adjacent river basins.
* 47.5 mgd pumped from Taunton River basin sources.
* 39.1 mgd discharged within Taunton River basin.
* Inflow/Outflow Analysis based on 1988 average day water demand of 72.2 mgd.
+24.7 mgd inflow from adjacent river basins.

Figure 19

Estimated Inflow/Outflow Result Due to Public Water and Wastewater Facility Operations.

+ 24.7 mgd (inflow from adjacent basins)
− 33.1 mgd (outflow to adjacent basins)

Result: − 8.4 mgd (loss from Taunton River basin)

TAUNTON RIVER BASIN

0 5 10 miles
0 10 kilometers

Based on precipitation and streamflow statistics, hydrologically significant drought episodes in the Taunton River basin have historically lasted approximately two years; however several droughts have persisted longer. The mid-1960's drought lasted more than 3 years while the early 1940's drought lasted over 4 years.

Many communities would most likely have extreme difficulty successfully meeting demand in the more severe mid-1960's drought (the drought of record) or the early 40's drought; therefore, the drought of 1980-81 was used to assess the minimum acceptable water supply system performance. The probability of recurrence of the 1980-1981 drought on the Taunton River is roughly one year in twenty. A community which succeeds in meeting projected water demand with the recommended water supply alternatives through the 1980-1981 drought may require further measures to succeed in the more severe drought of the mid-1960's. It should be emphasized, however, that communities should implement conservation measures to reduce their overall demands, not only in cases of drought, but as standard procedures to lessen environmental impacts and to decrease the need to develop more expensive new sources.

There are some subbasins in which the withdrawal of water is close to or surpasses the estimated yield in a moderate drought. These subbasins are Wading River at West Mansfield (#2), Rumford River at East Foxborough (#4), Canoe River (#7), Queset Brook (#11), Hockomock River (#12) and Trout Brook (#14). As shown in Table 5 , the existing water withdrawals in these subbasins are in excess of the unregulated, or virgin yields.

The first column in Table 5 lists each subbasin. The second column shows the yield of each subbasin that would be present 95 percent of the time during the 1980-1981 drought. Ninety-five percent was chosen for planning purposes, because a water supply source should be able to withdraw continuously 95 percent of the time during a 1-in 20-year drought. Column 3 shows the net loss or gain to the subbasin as a result of existing withdrawal and discharges in the subbasin and across the subbasin line. New diversions from a subbasin would increase the loss shown in column 3.

Column 4 shows the difference between columns 2 and 3. Since a negative yield cannot occur, negative values are shown as zeros. When the yield becomes more negative, the frequency of zero yields increases.

New wells which divert water from these subbasins will increase the stress on the subbasin, and wells will fail more frequently during a 1-in-20 year drought. In addition, new wells or increased withdrawals from existing sources which do not divert water out of the subbasin will be less reliable because there will be insufficient water during a drought period.

III. TAUNTON RIVER BASIN PLAN

A. Taunton River Basin Plan -- Planning Goals

1. PROTECT INSTREAM WATER USES
   Planning Tool:
   - Minimum Streamflow Threshold
   - Avoidance of stressed subbasins
   - Analysis of water supply and demand

2. PROVIDE 2020 WATER DEMAND DURING A 1-IN-20 YEAR DROUGHT
   Planning Tool:
   - Water Conservation
   - Existing Source Protection
   - New sources, if necessary

3. EFFICIENT USE OF RESOURCE
   Planning Tool:
   - Water Conservation

4. IMPROVE KNOWLEDGE OF BASIN'S HYDROLOGIC SYSTEMS
   Planning Tool
   - USGS hydrologic baseline information
   - DEM subbasin analysis
   - Identification of important water-dependent uses

5. PROTECT WATER QUALITY
   Planning Tool:
   - DEP Water Quality Plan
   - Local protection by-laws

6. INTEGRATE SCIENCE, PLANNING, ENGINEERING, AND REGULATION
   Planning Tool:
   - DEM, DEP, DFWELE, regional, basin-wide, and local coordination

B. Recommendation for Minimum Streamflow Threshold

The purpose of establishing a minimum streamflow threshold is to achieve a balance between consumptive and non-consumptive uses and functions of a river, its tributaries, and hydrologically connected surface and ground water systems. The minimum streamflow threshold is not intended as a substitute for the naturally occuring flow patterns in the river or its tributaries and by itself cannot ensure complete protection for all instream uses and functions. Nor should the minimum streamflow threshold be regarded as a flow level to be maintained as a maximum flow by withdrawing water to it. It is intended to provide a level of protection for the flows in the river, especially during periods of drought and, in so doing, to provide protection to the instream uses of the river system. Currently, there is no other basin-wide measure or means of protecting the needs of instream uses or balancing those needs with consumptive uses. Along with other actions, the minimum streamflow threshold provides a key point of departure for sound water resources managment in the basin.

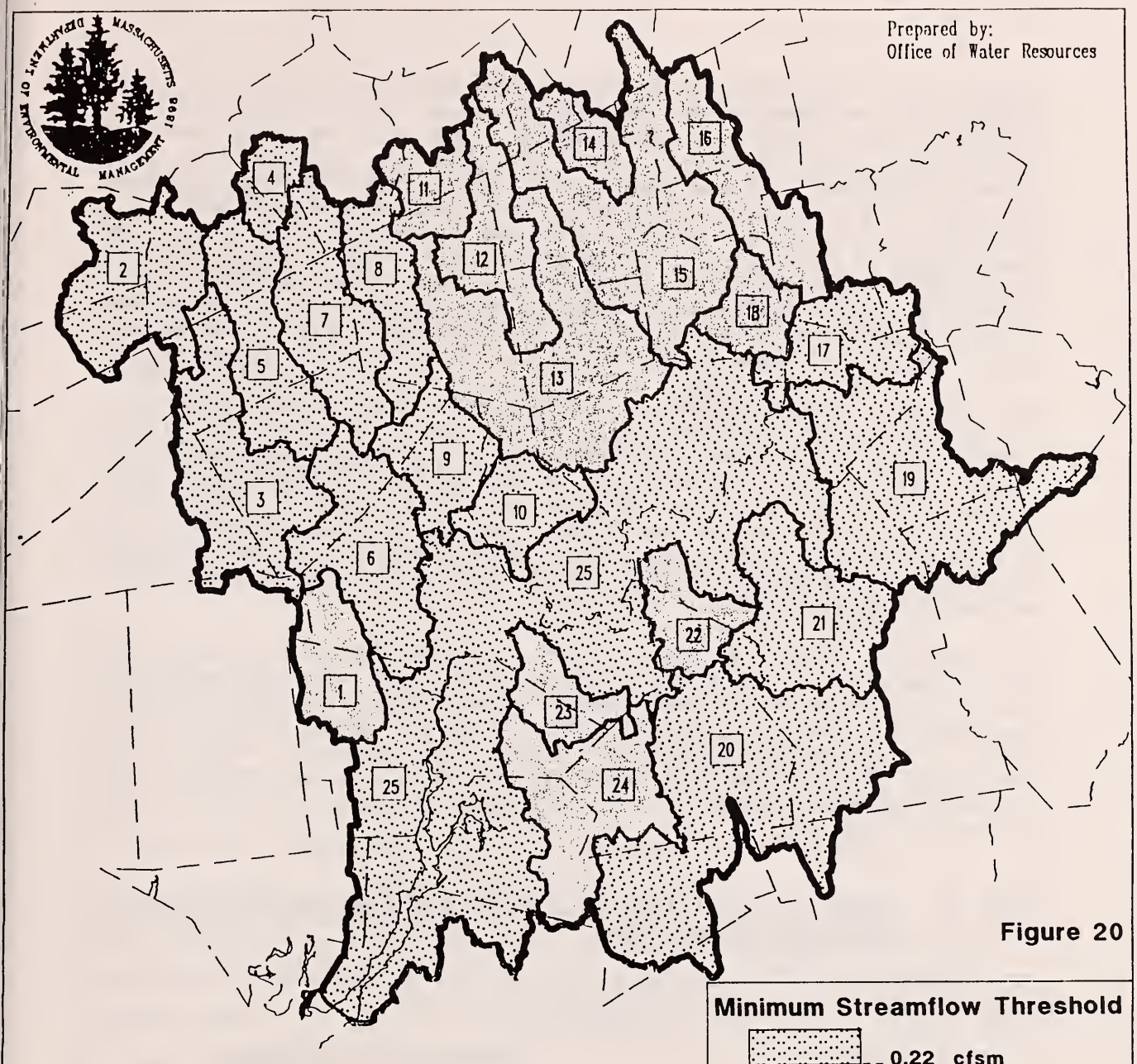
To arrive at the minimum streamflow threshold recommendation, the Office of Water Resources follows the Guidelines for Determining Reasonable Instream Flow, approved by the Water Resources Commission in April, 1987.

As described below, it is recommended that the minimum streamflow threshold for the Taunton River basin be 0.22 cubic feet per second per square mile (cfsm) and 0.15 cfsm for the following subbasins: Segreganset River, Cotley Brook, Assonet River, Poquoy Brook, Queset Brook, Hockomock River, Town River, Trout Brook, Matfield River, and Poor Meadow Brook (Figure 20). Two minimum streamflow thresholds are recommended for the Taunton River basin to reflect the different hydrology in the weak areas underlain by till and the stronger areas underlain by stratified drift. Because the flows in the till areas are naturally hydrologically weak, a lower minimumn streamflow threshold was recommended. The lower threshold, however, may be more restrictive in some headwater subbasins which have very little drainage area in addition to an absence of stratified drift.

1. Methodology

Step A. Identify the Streamflow Characteristics of the River

A thorough analysis has been conducted on the subbasins of the Taunton river basin (Figure 4) utilizing the Subbasin Yield Methodology (SUBY), which quantifies the amount of water available from the subbasins. These subbasin yields were determined for the selected planning drought (water years 1980, 1981). The yields calculated for all subbasins are the streamflows which would occur 95 percent of the time during a


Prepared by:
Office of Water Resources
Figure 20
Minimum Streamflow Threshold
0.22 cfsm
0.15 cfsm
Taunton River Basin Subbasins
1. Segreganset River
2. Wading River (Mansfield)
3. Wading River (Norton)
4. Rumford River (Foxborough)
5. Rumford River (Norton)
6. Three Mile River
7. Canoe River
8. Mulberry Meadow Brook
9. Mill River
10. Forge River
11. Queset Brook
12. Hockomock River
13. Town River
14. Trout Brook
15. Matfield River
16. Poor Meadow Brook
17. Robins Pond Outlet
18. Satucket River
19. Winnetuxet River
20. Nemasket River (Vaughn St)
21. Nemasket River (Middleborough)
22. Poquoy Brook
23. Cotley Brook
24. Assonet River
25. Taunton River-Main Stem
TAUNTON RIVER BASIN
0 5 10 miles
0 10 kilometers

repeat of the 1980-1981 drought. In addition, the long term daily flow records from the three gages and the discontinued Taunton River gage (at Bridgewater), as well as many partial record low flow stations, were analyzed to develop the flow duration curves for the period of record and for the planning drought; the average monthly flows for the period of record and the planning drought; and the average lowest ten day flows for the period of record and for the planning drought. The 1980-1981 statistics were selected as the flow conditions against which water uses were compared. Because the Taunton River gage was discontinued during the drought, the Threemile River and Wading River gages were used to generate the Taunton River statistics.

The Taunton River Basin is characterized by areas primarily underlain by stratified drift which have stronger low flows contrasting with areas underlain by till, which have weak low flows. In general the mainstem of the Taunton River and several larger tributaries, have higher low flows while someof its tributaries have weaker low flows. The flow characteristics of the Taunton River and some of its tributaries are also affected by the wetland areas which (in addition to the impoundments) buffer the peak flows.

The average annual Taunton River flow at the State Farm Gage (drainage area of 258 square miles) is 480 cfs over the period of record (1930-1975 and 1985-1988). The average monthly flow for the period of record ranges from 150 cfs in August to 961 cfs in March. The average monthly flows (calculated) during the 1980-1981 drought range from 67 cfs to 1,135 cfs, and the average of the lowest 10 consecutive days during the drought ranges from 31 cfs to 725 cfs.

Step B. Identify Significant Existing and Planned Streamflow-Dependent Water Uses.

OWR requested the following state and local agencies to identify significant streamflow-dependent water uses

Water Uses	Responsible Agencies
- Resident fisheries	Division of Fisheries and Wildlife
- Anadromous and other Marine Fisheries	Division of Marine Fisheries
- Parks	Division of Forests and Parks
- Recreation	Conservation Commissions Appalachian Mountain Club Taunton River Watershed Alliance; Canoe River Aquifer

	Advisory Commission Division of Resource Conservation (DEM)
- Receipt of treated wastewater	Division of Water Pollution Control USEPA
- Wetlands	Division of Wetlands and Waterways Army Corps of Engineers U.S. Dept. of Agriculture
- Scenic Rivers	Rivers Program, Division of Resource Conservation
- Inland ACEC (Area of Crtitical Environmental Concern)	Divison of Resource Conservation
- Municipal water supply	Office of Water Resources (DEM), Division of Water Supply (DEP), Local water supply agencies
- Agricultural water use	Department of Food and Agriculture, Division of Water Supply Cape Cod Cranberry Growers U.S. Soil Conservation Service
- Industrial Water Use	Division of Water Supply;

The significant existing and planned water uses and locations as identified by the state and other agencies are summarized below:

WATER USE	LOCATION	PERIOD OF WATER USE
A. Instream Water Uses		
Resident Fisheries		
Trout (Native)	Henkes Brook Box Brook McGarry Brook Bassett Brook Fords Brook Pratts Brook Poquoy Brook Puddingshear Brook	year round

	Rumford River (Potential)	
Trout (Stocked)	9 tributaries	spring
Mixed warm water species	Mainstem	year round
Anadromous and Other Marine Fisheries: Alewife, Rainbow smelt Blueback herring, White Perch American eel, striped Bass, other Anadromous species	Mainstem below Jenkins Dam, Bridgewater Existing or Potential areas: Mill River, Forge River Cotley River, Poquoy Brook, Nemasket River, Fall Brook Matfield River, Beaver Brook, Town River	Spring, Fall
Shellfish	Taunton River below confluence with Segreganset River	year round
Receiving Treated Wastewater		
55 Industrial discharges	Taunton River, tributaries	year round
7 Wastewater treatment plants	and reservoirs "	year round
2 Combined sewage overflow	"	year round storm events

WATER USE	LOCATION	PERIOD OF WATER USE
Recreation		
Canoeing (flat water)	Taunton, Satucket, and Matfield Rivers (Wampanoag Canoe Passage)	Spring-Fall
	Wading and Threemile Rivers, Lakes and Ponds	Spring-Fall
	Town and Canoe Rivers	Spring
Canoeing (class I rapids)	Taunton River: Bridgewater to Taunton	
Hiking	Forest and Parks	year round
Forests and Parks		
Ames Nowell State Park	Tributary and pond	year round
Borderland State Park	Tributary and pond	year round
Dighton Rock State Park	Taunton/Assonet	year round
F. Gilbert Hills State Park	lake	year round
Massasoit State Park	Ponds	year round
Freetown State Forest	Tributaries	year round
Wrentham State Forest	Tributaries	year round
Wetlands	Tributaries and mainstem	year round
Scenic Rivers	Tributaries and mainstem	year round
Inland ACEC - Hockomock Swamp	Tributaries in ACEC	year round
B. Out-of-stream Water Uses		
Municipal Water Supply	Out-of-stream water uses are located throughout the basin and include well, stream and pond withdrawals	year round
Agricultural Water Use Cranberry Bogs	Taunton River and tributaries	year round
Industrial Water Use	Taunton River, tributaries and reservoirs	year round

Step C. Develop the Instream Flow Needs for Each of the Significant Streamflow-Dependent Water Uses (See Inventory section above)

Step D. Prepare Recommendations For Minimum Streamflow Threshold

In arriving at its recommendations, OWR carries out its analysis with a number of operating principles. First, It has been found in other basins as well as the Taunton that there is no single flow threshold that will satisfy the optimum water needs of all users of the river; however, in bringing its recommendations to the Water Resources Commission, OWR strives for consensus among state and local agencies and groups. For example, fisheries biologists estimate that the minimum flows required to sustain fisheries in ungaged New England streams is 0.5 cfsm. Because this is a regional value based on studies of unregulated New England rivers and is designed to give guidance in determining releases from hydroelectric projects, its use in gaged streams with multiple uses has been criticized. It is important to note, however, that lacking knowledge about the specific relationship between streamflow and species needs, this number provides a conservative point of departure for instream flow needs of fisheries and other aquatic orgnanisms. As noted below, the basin plan recommends that additional research be carried out to obtain more specific information on this issue.

Advocates for higher minimum flows often have commented that the OWR recommendations for minimum flow fall short of this value and may endanger the ecology of the basin. Especially for instream uses, maintaining higher streamflows generally is regarded as more desirable. Industrial and municipal water users often have felt that the recommendation for minimum flow is too high and places an unnecessary burden on their operations and may serve to constrain economic growth and regional economic development. A key role of the basin plan is to balance these needs and concerns. One way the basin plan does so is to strongly recommend the implementation of water conservation and demand management programs. Achieving greater conservation in the basin will reduce demands on basin water resources, perhaps reducing the need for additional wells; will provide additional water for out-of-stream needs from existing sources; and will contribute to maintaining streamflows that more closely reflect natural variability.

The process also involves balancing current and future demands for water withdrawals with significant instream and non-consumptive needs. OWR seeks to improve the current standard of protection by developing a minimum streamflow threshold that is sensitive to instream uses (fisheries, canoeing, wetlands) as well as out-of-stream uses.

The recommendations are designed to be practical, reasonable and readily applicable by DEP in the administration of the Water Management Act and the WRC in the administration of the Interbasin Transfer Act. The recommended flow level is also meant to accommodate reasonable residential, commercial, and industrial growth in the basin. While conservation measures are recommended, it must be recognized that implementing conservation measures that result in major changes in consumer habits require time. It is also important that the projections of demand be based on the best information of current trends and actual water uses. Once these are laid out, the basin plan recommends that future demands be reduced through conservation and demand management. Finally, OWR seeks to recommend a flow level that recognizes the current limitations on the knowledge about instream flow uses and the need for review and update every five years to incorporate new research into the basin plan.

2. Recommendations

Step E. Recommendations

It is recommended that the minimum streamflow threshold for the Taunton River basin be 0.22 cubic feet per second per square mile of watershed (cfsm) year round and 0.15 cfsm in the following subbasins: Segreganset River, Cotley Brook, Assonet River, Poquoy Brook, Queset Brook, Hockomock River, Town River, Trout Brook, Matfield River, and Poor Meadow Brook. The recommendations are based on the analysis of the following streamflow uses.

(1) Resident Fisheries: To reduce potential impact on fisheries and to promote water conservation, the following steps are recommended:

(i) DEP's Division of Water Pollution Control's water quality standards for the Taunton River should be met.

(ii) Local water conservation plans should be implemented.

(iii) DEP should give special consideration to the 9 stocked trout tributaries in permitting new sources which would affect the flows between March 15 and June 15 in the streams.

(iv) Research should be conducted to determine more precisely the flow needs for resident fisheries.

(2) Anadromous and Other Marine Fisheries: (i) - (ii) above

(iv) The Water Resources Commission, when reviewing proposed interbasin transfers out of the Tauton River Basin, should give special review to the possible impacts of the transfer upon anadromous and other marine fisheries especially with respect to the periods of mid-September

to mid-October and March through May for the tributaries which have marine fisheries and the mainstem of the Taunton River downstream of the Jenkins Company Dam in Bridgewater.

(v) The Division of Marine Fisheries recommends that a spring minimum flow not be set at this time as the Division's current analysis are preliminary, and emphasis should be placed upon protecting this resource during the case-by-case review of proposed projects. Near term research should be conducted to determine more precisely the flow needs for anadromous fisheries, so that a special Taunton River spring minimum streamflow threshold could be considered by the WRC in the future.

(3) Wastewater: continue use of 7Q10 DEP dilution threshold of 0.10 cfsm for the Taunton River.

(4) Recreation: it is recommended:

(i) that the DEP Division of Water Pollution Control's water quality standards for the Taunton River be achieved.

(ii) that the scenic areas along the Wampanoag Canoe Passage, a canoe route connecting Narragansett Bay and Cape Cod Bay, be protected.

(5) Forests and Parks: The Division of Forests and Parks water resource concern is recreation and fisheries, so the recommendation is the same as Recreation (see above), and Resident Fisheries (see above).

(6) Wetlands: Research needs to be conducted to determine the flow needs for wetlands.

(7) Municipal and Self-Supplied Water Suppliers: All suppliers withdrawing more than 100,000 gallons per day should operate their withdrawals in accordance with DEP's Water Management Act. Communities should implement local water conservation plans.

(8) Inland ACEC:

(i) The Hockomock Swamp ACEC should be protected through special consideration to projects and permits within this area. Local management plans required by the designation should be followed.

(ii) The recommendations for canoeing and wetlands also apply to this area.

C. Recommendations for Water Conservation Management

1. Introduction

The Massachusetts Water Supply Policy Statement (1984 update) sets out the guidelines for water supply and demand management policies and administrative management policies to ensure that water is available in sufficient quantity and quality for municipalities in the Commonwealth. The Water Management Act (MGL C.21G), which became effective in March 1986, has the general goal of assuring adequate water supplies for current and future water needs. As a part of that effort, in October 1986, the Water Resources Commission adopted guidelines for a minimum community water conservation program. These and other applicable laws and regulations have been considered in the preparation of the alternatives for all basin communities.

Section IV of this report summarizes the water supply situation for each community and describes the local Water Supply Management Plans for providing water to each community through the year 2020. One of the key components of local water resources management, as stipulated by the Water Resources Commission (313 CMR 2.00), is the "consideration and evaluation of measures for conservation of water as those measures relate to a particular community".

There are several reasons to emphasize conservation in the Taunton River basin. Overall use of water in the basin has increased during the past several decades. The ground water resources are limited in some parts of the basin because glacial stratified drift aquifers are thin, narrow, and discontinuous. In dry periods, water levels in aquifers decline, causing mandatory reductions in pumping rates. Another important reason is that many streams and ponds are hydraulically connected to the stratified drift aquifers used for municipal supply. (Latham 1988) It is during these dry periods when low flows occur naturally on the river, that fisheries and other instream uses are most in need of available flows. In addition, communities which rely solely on ground water have limited storage unless supplemented by man-made facilities such as standpipes. Wells located near the river or subbasins may reduce the flows.

The next section describes recommended actions needed to implement a water conservation plan for all communities with public water supply systems.

2. Recommended Components of a Water Conservation Plan

In October 1986, the Water Resources Commission adopted guidelines (published in February, 1987) containing components of a minimum water conservation plan for the purpose of assisting communities in preparing local water conservation plans. The guidelines state that although the content of each Local Water Conservation Plan will vary according to the characteristics of each community, the plan should include at a minimum:

a. an overall summary of the water conservation plan;
b. a complete assessment of the community's water conservation potential;
c. a statement of water conservation goals and objectives;
d. a detailed description of the components of the water conservation plan;
e. a timetable for implementation of the plan;
f. a list of people/agencies responsible for the implementation of the plan;
g. a description of the program's funding sources.

It is recommended that the components of a conservation plan (point d. above) include a timetable for implementation, including milestones to measure progress toward meeting a community's specific objectives in conserving water. Specifically, a conservation plan should include the following measures, actions, and goals:

Protection of existing water supply sources: Critical water resource areas are identified (recharge areas for wells, watersheds); land or development rights to these areas are acquired; zoning is adopted to protect these areas; local by-laws are adopted to control underground storage tanks, hazardous materials, road salt, erosion; land uses inventoried in critical water resource areas; water resource protection committee is set up; an educational program is begun to increase awareness of the relationship between land use and water quality (The Metropolitan Area Planning Council recently released a draft study recommending specific steps for each community in its area. That study is now under review);

Metering: All consumptive users, including public buildings, are metered 100 percent; a meter replacement program is in place with the ability to test, re-calibrate, repair, or replace meters on a regular basis;

Leak Detection and System Rehabilitation: One hundred percent of the system is checked for leaks every other year; every detectable leak is fixed as soon as possible; a system rehabilitation program is in place with adequate financial

resources for maintenance and unexpected problems; interconnections are maintained with neighboring communities;

Pricing: Water rates are based on the full cost of providing water (i.e. enterprise account); seasonal pricing and/or block rates are implemented to reduce demands;

Public Education/Information/Participation: An ongoing education program is in place, including water conservation information in the water bills, school conservation curricula, and education for municipal employees; continual interaction and consultation with community leaders and interest groups which have concerns about conservation;

Drought and Emergency Procedures and Planning: An emergency response plan is in place, outlining who is responsible to do what, when, how, and with what resources, including a description of how essential services will be maintained and who is responsible; a program is in place for progressively stringent water use reduction indicating who will reduce where, how much, and how; emergency water supply sources and interconnections are identified.

Efficient water fixtures and other measures: Building and plumbing codes are enforced for new construction and substantial rehabilitation; public buildings are retrofitted with water saving devices; long-term water conservation measures are considered.

These measures should be undertaken by all communities, whether or not they anticipate water supply problems in the future. Ideally, a conservation measure or an entire program could be evaluated on its effectiveness in reducing water consumption. Accurately predicting the water savings that will result from a particular conservation measure is seldom possible because, typically, it is part of a conservation program which includes a combination of several measures (i.e., public education, leak detection and repair, meter testing and replacement, etc.). Different combinations may produce different results in terms of water savings. Moreover, it is seldom possible to measure the specific impact of a water conservation program on community water consumption because there are so many variables operating at the same time. Some measures, such as replacing toilets, may take 20 to 30 years to fully implement. Thus, the recommendations for conservation are generalized with the overall goal of encouraging each community to maximize its conservation efforts.

Because conservation often can reduce water demand significantly, it should be the first "source" considered by water users; however, it cannot always be counted on as a substitute for

seeking new or expanding additional local and regional sources of water supply where they are needed.

It is clear, however, that conservation will play an increasingly important role in water resource management at the state and local level. The recommendations in the next chapter should be considered minimum steps; more specific programs will be developed to identify additional water savings in each community's Local Water Conservation Plan.

C. Water Conservation Scenarios

The following scenarios provide the recommended water conservation savings and the resulting reductions in water demand that can be expected from communities in the Taunton River basin. There is always room for additional efforts to increase conservation levels, and those should be continually stressed; however, for sound planning, changing consumer behavior must be viewed cautiously. Based on that view and the assumptions outlined in the demand projection methodology, this basin plan has presented reasonable expectations of future water demand.

OWR recognizes the hard work and achievements by all the communities in the study area to lower their water demand through conservation and system efficiencies. Since the basin planning period is 30 years, it is expected that new water saving technology and methods will be introduced, and the successes to date indicate that more conservation will be possible.

This section shows how the basin plan projections of water demand compare with the demands as reduced by the conservation goals recommended in the basin plan for each community and an additional, higher conservation scenario (Table 6). Based on historic trends, OWR water demand projection methodology assumes that gallons per capita day will increase by 5 percent per decade (15 percent through the planning period) due to commercial and industrial expansion and minimum conservation efforts. The conservation scenarios assumes that communities, through more intensive water conservation efforts, can offset the 15 percent increase in GPCD through the planning period.

The Taunton River basin plan projects that average day demand will increase by 17.13 mgd (24 percent) by 2010. The plan recommends that each community carry out a maximum conservation and water supply management plan to use water as efficiently as possible. As shown on Table 6, Goal 1 assumes that GPCD will increase by five percent over the planning period. Goal 2 assumes that GPCD remains at the current level throughout the planning period and that overall water demand increases only due to growth in population. Thus, any growth

Table 6

1995 to 2010 Average Day Demand (ADD) Projections
and Conservation Goals
Taunton River Basin Study Area
Million Gallons per Day (mgd)

COMMUNITY	1987 to 1989 BASE ADD	PROJECTIONS 1995 ADD	PROJECTIONS 2000 ADD	PROJECTIONS 2010 ADD*	CHANGE IN DEMAND (MGD) BASE TO 2010	GOAL 1 2010 PROJECTED 5% INCREASE IN GPCD	GOAL 2 2010 PROJECTED NO INCREASE IN GPCD	GOAL 3 2010 PROJECTED 5% DECREASE IN GPCD
Abington	1.37	1.39	1.43	1.60	0.23	1.53	1.45	1.38
Acushnet	0.50	0.55	0.62	0.67	0.17	0.64	0.61	0.58
Attleboro	5.27	5.48	5.81	5.97	0.70	5.70	5.42	5.15
Avon	0.45	0.55	0.56	0.61	0.16	0.59	0.57	0.54
Berkley	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Bridgewater	1.82	1.91	2.06	2.40	0.58	2.29	2.18	2.07
Brockton	11.64	11.47	11.65	13.70	2.06	13.07	12.44	11.82
Dartmouth	2.13	2.37	2.57	2.95	0.81	2.82	2.69	2.56
Dighton						0.00	0.00	0.00
N. Dighton FD	0.15	0.16	0.17	0.17	0.02	0.16	0.15	0.15
Dighton WD	0.69	0.78	0.88	0.88	0.19	0.84	0.80	0.76
E. Bridgewater	1.05	1.08	1.13	1.21	0.16	1.15	1.10	1.04
Easton	1.58	1.67	1.75	2.34	0.76	2.23	2.13	2.02
Foxborough	2.47	2.50	2.58	2.67	0.19	2.51	2.39	2.27
Freetown	0.01	0.01	0.02	0.02	0.00	0.02	0.02	0.01
Halifax	0.49	0.52	0.56	0.66	0.17	0.63	0.60	0.57
Hanson	0.72	0.76	0.79	0.90	0.18	0.86	0.82	0.78
Lakeville						0.00	0.00	0.00
Mansfield	2.12	2.20	2.32	2.52	0.40	2.40	2.29	2.17
Middleborough	1.82	2.25	2.42	3.03	1.21	2.90	2.78	2.65
New Bedford	17.47	18.17	19.21	19.58	2.11	18.69	17.81	16.92
Norton	1.29	1.45	1.55	1.85	0.56	1.77	1.68	1.60
Plainville	0.53	0.58	0.62	0.58	0.05	0.55	0.52	0.50
Plympton						0.00	0.00	0.00
Raynham						0.00	0.00	0.00
N. Raynham	0.32	0.86	0.88	0.90	0.58	0.88	0.87	0.85
Raynham Center	0.74	1.08	1.13	1.20	0.46	1.16	1.11	1.07
Rockland	2.03	2.08	2.18	2.21	0.18	2.11	2.00	1.90
Sharon	1.54	1.60	1.69	1.62	0.08	1.55	1.47	1.40
Somerset	3.02	3.71	3.91	4.42	1.40	4.28	4.13	3.98
Stoughton	2.26	2.26	2.32	2.41	0.15	2.30	2.19	2.09
Taunton	5.82	6.29	6.72	8.41	2.59	8.09	7.78	7.46
W. Bridgewater	0.85	0.88	0.92	1.53	0.67	1.48	1.43	1.39
Whitman	0.96	0.97	0.99	1.13	0.18	1.08	1.03	0.98
Wrentham	1.19	1.26	1.43	1.32	0.13	1.26	1.20	1.14
TOTALS	72.31	76.83	80.88	89.45	17.13	85.54	81.67	77.80

* Additional Conservation and Demand Management Measures are Encouraged to Reduce Projected Demands

NET INCREASE IN DEMAND FROM BASE ADD TO 2010 ADD	17.13 MGD	13.22 MGD	9.35 MGD	5.48 MGD

in water must be offset by increases in system efficiencies or decreases in water use. OWR recognizes that as more conservation is carried out, the next increment will be harder to find and more expensive to implement. It is also assumed that industrial and commercial water users will install water saving devices and utilize processing systems that reuse or otherwise conserve water. Goal 3 assume that GPCD will be lowered by five percent over the planning period.

The extent to which communities actually will achieve savings and reduce water demands depends on a series of interacting variables including the availability of funding, educational programs, retrofit programs, community economic character, public attitude, and other needs that are specific to each community. The amount of time it will take to achieve those savings will depend on how much savings already has been achieved by individual communities and their willingness and ability to do more. The implementation of water saving measures must be viewed as one part, albeit a key component, of the management of the basin water resources. A realistic planning approach must take current trends into account along with a reasonable expectation of changes in water use habits, technologies, policies, and programs. Thus, the basin planning methodology for the Taunton River Basin includes a presumption of increasing GPCD because that is what historically has occurred and because changes in water use habits, laws, and technology take time to phase in. When the basin plan is revised every five years, new trends in water uses will be taken into consideration.

To approach the lower water demand levels will require a significant change in water use habits by individuals and businesses. In addition to the rapid and widespread installation of low flow toilets and other water saving devices, the maximum conservation scenario requires a concerted effort by state and local governments and agencies (including funding for public education and retrofit programs) to attain cooperation by individual water users.

Plotted together, the Basin Plan ADD projections and the projected ADD with conservation goals, and the three conservation scenarios provide a range of possible future water demands.

D. Recommended Community Water Supply Management Plans

The individual community public water supply management plans presented in this chapter were developed from specific information provided by the respective local water supply agencies regarding their current and future plans for water supply management. Each community plan includes:

- current and projected water demands
- current water supply sources
- water resource management recommendations by OWR
- community water resources activities, and
- community water conservation plans and recommendations.

These plans and their recommended alternatives are projected to meet 2020 water demand in a one-in-twenty year drought while still honoring streamflow guidelines.

As described in Chapter Three, it is recommended that each community prepare and implement a water conservation plan as part of the overall basin plan. Self-supplied industrial water use has been analyzed in Appendix 1 and all such water users are recommended to implement and carry out a water conservation plan.

TOWNS OF ABINGTON AND ROCKLAND

1. **Public Water Supply System:** The towns of Abington and Rockland are serves by the Abington-Rockland Joint Water Works.

   a. **Current and projected water demand** The combined base demand was 3.40 mgd. OWR projects that the Towns of Abington and Rockland will have a combined 2010 average day demand of 3.81 mgd, an increase of 0.41 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Abington-Rockland Joint Water Works currently has one wellfield in the Taunton River basin: the Myers Avenue Wells. The Water Works also has two surface water sources in the South Coastal basin: the Hingham Street Reservoir and Great Sandy Bottom Pond.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Abington-Rockland Joint Water Works officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Water Supply Sources**
      1. Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.
      2. Rehabilitate the Myers Avenue Wells in Abington to prior capacity.
      3. Continue with expansion of the Hingham Street Reservoir in Rockland. Obtain a Water Management Act permit from DEP for the increased capacity.

   b. **Protecting Water Supply Sources**
      Continue to implement measures to protect local sources.

   c. **Water Conservation**
      Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
      None

3. **Other Water Resource Management Activities** None planned

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Abington-Rockland Joint Water Works has not submitted a Water Conservation Plan to the Water Resources Commission. However, OWR has been in contact the Water Works to discuss conservation measures implemented or planned. The following is a summary of present and planned future water conservation efforts based on information from the Abington-Rockland Joint Water Works and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 13%

Metering:
Existing - 100% metered; Replace meters every ten years

Leak Detection:
Existing - No formal leak detection program; fix all leaks as soon as possible

Pricing:
Existing - Flat Rate
Full cost pricing

Public Education:
Existing - Voluntary restrictions; advertise on cable news

Drought Planning:
Existing - No formal plan

Water Saving Fixtures:
Existing - No program
Plumbing code enforced

Protection:
Existing - Own land around sources

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Prepare a Water conservation Plan meeting Water Resource Commission guidelines
- Institute a regular leak detection program to survey the entire system for leaks every 2 years
- Develop formal drought management plan
- Make water saving fixtures available to residential customers.

TOWN OF ACUSHNET

1. **Public Water Supply System:** The Town of Acushnet is served by the Acushnet Water Department.

   a. **Current and projected water demand** The base demand was 0.50 mgd. OWR projects that the town of Acushnet will have a 2010 average day demand of 0.67 mgd, an increase of 0.17 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Acushnet Water Department purchases all its water from the New Bedford Water Department.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Acushnet officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Water Supply Sources**
   Renew contract with New Bedford.

   b. **Protecting Water Supply Sources**
   Not Applicable

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   None

3. **Other Water Resource Management Activities** None

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Acushnet Water Department has not submitted a Water Conservation Plan to the Water Resources Commission. However, OWR has been in contact the Water Department to discuss conservation measures implemented or planned. The following is a summary of present and future water conservation efforts based on information from

the Acushnet Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 17%

Metering:
Existing - 100% metered;

Leak Detection:
Existing - No program

Pricing:
Existing - Flat Rate
Full cost pricing

Public Education:
Existing - No program

Drought Planning:
Existing - No formal plan; keep in close contact with New Bedford concerning restrictions

Water Saving Fixtures:
Existing - No program

Protection: Not applicable

b. Recommended Additional Water Conservation and Source Protection Measures

- Reduce unaccounted-for water to no more than 15%
- Prepare a Water Conservation Plan meeting Water Resources Commission guidelines
- Institute a regular leak detection program to survey the entire system for leaks every 2 years.
- Make residential retrofit devices available to the public; install water-saving devices in all public buildings
- Institute a meter testing/replacement program
- Institute a public education program
- Investigate increasing block rate structure

CITY OF ATTLEBORO

1. **Public Water Supply System:** The City of Attleboro is served by the Attleboro Public Works Department, Water Division.

   a. **Current and projected water demand** The base demand was 5.27 mgd. OWR projects that the city of Attleboro will have a 2010 average day demand of 5.97 mgd, an increase of 0.70 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Attleboro Water Department currently has one ground water wellfield located in the Taunton River basin: the Wading River Station. Attleboro also has a ground water station located in the Ten Mile River basin: the West Street Station.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Attleboro officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Institute emergency connection with the City of Pawtucket, Rhode Island.

3. **Other Water Resource Management Activities** OWR has identified Attleboro as a deficit community. Existing and planned sources will not serve to meet the community's projected 2010 demand in a planning drought. The Ten Mile River basin has not been studied by OWR to date. It has not been determined if sufficient water will be available during the planning drought for increased withdrawals from the West River Station. The City may have to rely more heavily on emergency sources to meet demands during a moderate drought.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Attleboro Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Attleboro Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 10%

Metering:
Existing - 100% metered; Ongoing meter replacement and repair program; 50% of meters externally read
Future - Continue with program

Leak Detection:
Existing - Fix leaks as soon as possible
Future - Perform a leak detection survey
Continue to replace older water mains and valves

Pricing:
Existing - Full cost pricing
Flat Rate
Residential customers billed semiannually
Industrial customers billed monthly
Future - Adjust water rates to meet rising costs

Public Education:
Existing - Ongoing public education program
Voluntary restrictions

Drought Planning:
Existing - Have plan
Future - Reduce peak demands

Water Saving Fixtures:
Existing - No program
Enforce plumbing code
Contacted large users about reducing water use

Protection:
Existing - Have water resources protection zoning
Own recharge areas and portions of the watershed
Have reduced road salt areas

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Achieve 100% metering; meter all public buildings.
- Institute a regular leak detection program to survey the entire system for leaks every 2 years.
- Make residential retrofit devices available to the public; install water-saving devices in all public buildings
- Continue to work with large water users to conserve water.
- Institute increasing block rate

TOWN OF AVON

1. **Public Water Supply System:** The Town of Avon is served by the Avon Water Department.

   a. **Current and projected water demand** The base demand was 0.45 mgd. OWR projects that the town of Avon will have a 2010 average day demand of 0.61 mgd, an increase of 0.16 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Avon Water Department currently has six ground water stations located in the Taunton River basin: Memorial #1, #2 (not in use), Theatre #3, Connolly Road #4, Porter, and Trout Brook Well Field.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Avon officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Continue to explore for sources in the Matfield River subbasin to meet future demand.

3. **Other Water Resource Management Activities** The Town has been investigating the development of a deep rock well near Harrison Blvd.

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Avon Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Avon Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 13%

Metering:
Existing - 99.3% metered;
Ongoing meter replacement program
50% externally read
Future - Continue with installation of externally-read meters for all residential users

Leak Detection:
Existing - No program
Future - Conduct a water audit
Continue system rehabilitation of all old water mains

Pricing:
Existing - Increasing block rate for metered users
Flat rate for unmetered users (less than 1% of all users)

Public Education:
Existing - No program
Future - Increased public relations to increase public awareness of water system

Drought Planning:
Existing - Have plan

Water Saving Fixtures:
Existing - No program
Enforce plumbing code
Future - Encourage water saving fixtures

Protection:
Existing - Owns 46 acres of aquifer protection recharge lands
Actively pursuing the purchase of other aquifer lands

b. Recommended Additional Water Conservation and Source Protection Measures

- Achieve 100% metering; meter all public buildings.
- Institute a system-wide leak detection survey to survey the entire system for leaks every 2 years.
- Institute an Enterprise Account
- Make residential retrofit devices available to all customers; install water saving devices in all public buildings.
- Work with industries to promote conservation.

TOWN OF BERKLEY

1. **Public Water Supply System:** The Town of Berkley currently has no central public water supply, however a small portion (less than 2%) is served by the Taunton Water Department.

   a. **Current and projected water demand** The base demand for this portion of Berkley was less than 0.01 mgd. OWR projects that this demand will increase to 0.01 mgd by 2010. This is a negligible increase over the Base Demand. This increase in demand is accounted for by an increase in population growth and an increase in residential gpcd.

2. **Water Resources Management Recommendations** See Taunton for Water Resources and Conservation Management recommendations.

TOWN OF BRIDGEWATER

1. **Public Water Supply System:** The Town of Bridgewater is served by the Bridgewater Water and Sewer Department.

   a. **Current and projected water demand** The base demand was 1.82 mgd. OWR projects that the town of Bridgewater will have a 2010 average day demand of 2.40 mgd, an increase of 0.58 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Bridgewater Water Department currently has seven ground water stations located in the Taunton River basin: Carvers Pond #1 (not in use), #2, #4, #5, #7, and High Street #3 and #6.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Bridgewater officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
      1. Develop proposed well site #1 in the Taunton River Main Stem subbasin.
      2. Investigate and develop another source in the Taunton River Main Stem subbasin.

3. **Other Water Resource Management Activities** None planned

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were

developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Bridgewater Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Bridgewater Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: >1%

Metering:
Existing - 95% metered

Leak Detection:
Existing - No program

Pricing:
Existing - Flat Rate
Future - Planning on increasing rates

Public Education:
Existing - Encourage conservation through newspaper advertisements

Drought Planning:
Existing - No plan

Water Saving Fixtures:
Existing - No program
Enforce plumbing code

Protection:
Existing - Identified critical aquifer recharge areas

b. Recommended Additional Water Conservation and Source Protection Measures

- Achieve 100% metering; meter all public buildings; institute program of meter testing and repair
- Work with large water users and encourage them to install water-saving systems.
- Conduct a water audit.
- Institute a leak detection and repair program to survey the entire system for leaks every 2 years.
- Investigate increasing block rate billing structure.
- Institute a public education program.
- Develop a drought/emergency plan
- Make residential retrofit devices available to all customers; install water-saving devices in all public buildings.

- Enact an aquifer protection by-law; purchase aquifer recharge areas or acquire development rights to these areas were feasible.

CITY OF BROCKTON

1. **Public Water Supply System:** The City of Brockton is served by the Brockton Department of Public Works, Water Division.

   a. **Current and projected water demand** The base demand was 11.64 mgd. OWR projects that the city of Brockton will have a 2010 average day demand of 13.70 mgd, an increase of 2.06 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Brockton Water Department currently diverts water from a surface water source, Monponsett Pond, located in the Taunton River basin, to its main source, Silver Lake, located in the South Coastal basin. The City also diverts water from Furnace Pond located in the South Coastal basin.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Brockton officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Work with the towns of Pembroke, Kingston and Halifax to implement measures to protect Silver Lake.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
      1. Treatment plant at Avon Reservoir is expected to be completed and source on line by mid-April 1991.
      2. Investigate development of a permanent surface water supply source in the Winnetuxet or Taunton River Main Stem subbasin.

3. **Other Water Resource Management Activities**
Continue to work with the Southeastern Massachusetts Partnership and Old Colony Planning Council to investigate buying water from neighboring communities to meet short term demands.

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Brockton Water Division has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Brockton Water Division and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 14.9%

Metering:
Existing - 99% metered; Approximately 33 buildings remain unmetered; Closing dead ends which cause meters to clog
Future - Complete conversion to externally read meters

Leak Detection:
Existing - Have completed surveying more than half of the system; Leak detection survey within the City is complete
Leaks repaired immediately
Future - Complete survey of entire system; conduct leak detection surveys of entire system every two years

Pricing:
Existing - Enterprise account
Flat Rate
Semiannual billing

Public Education:
Existing - Ongoing program
Water Resources Officer
Future - Continue with public education program; educate landlords to the benefits of installing water-saving devices.

Drought Planning:

Existing - Have plan

Water Saving Fixtures:
Existing - Installed in public buildings
Have made fixtures available to residential customers
Enforce plumbing code

Protection:
Existing - Watershed management plan for Silver Lake
Investigating ways to raise funds to purchase more land at Silver Lake
Future - Acquire more land around Silver Lake

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Achieve 100% metering; conduct routine meter repair and calibration; institute an on-going meter replacement/repair program.
- Institute an increasing block rate billing structure.
- Pursue acquisition of watershed lands or development rights to watershed lands; work with the Towns of Pembroke, Plympton, Halifax and Kingston to protect Silver Lake.

TOWN OF DARTMOUTH

1. **Public Water Supply System:** The Town of Dartmouth is served by the Dartmouth Department of Public Works, Water and Sewer Division.

   a. **Current and projected water demand** The base demand was 2.13 mgd. OWR projects that the town of Dartmouth will have a 2010 average day demand of 2.95 mgd, an increase of 0.81 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Dartmouth Water Department currently purchases up to 0.5 mgd from the City of New Bedford, which has surface water sources within the Taunton River basin. Dartmouth also has six ground water sources within the Buzzards Bay basin: A Well (not in use), B & C Well, Violetta Well, Route 6 Well (not in use) and D Well.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Dartmouth officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Renew contract with New Bedford. Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources within the Buzzards Bay basin.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   See 3.

3. **Other Water Resource Management Activities** The Buzzards Bay basin has not been studied by OWR to date. It has not been determined if sufficient water will be available during the planning drought for test well sites 1 and 2 and the rehabilitated A Well.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Dartmouth Water & Sewer Division has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Dartmouth Water & Sewer Division and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 11%
Metering:
Existing - 100% metered
Ongoing meter replacement program
Future - Continue with replacement program to complete installation of new externally read meters

Leak Detection:
Existing - Annual Leak detection survey to survey 25% of system each year
Water Audit
Future - Continue with leak detection surveys
Repair leaks as soon as detected
Consider rehabilitation of remaining 30 miles of old cast iron water main.

Pricing:
Existing - Increasing block rate
Enterprise Account
Future - Full cost pricing
System development charge
Annual rate review

Public Education:
Existing - Ongoing program; encourage conservation as a "part of our normal daily routine"
Encourage industrial/commercial conservation
Future - Expand school program

Drought Planning:
Existing - No plan
Future - Plan under development

Water Saving Fixtures:
Existing - No program
Plumbing code actively enforced
Work with large users to encourage water saving processes

Protection:
Existing - Aquifer protection bylaw
Cooperative oil recycling program
Low salt application areas
Future - Ongoing land acquisition for protection of existing and potential supplies
Expand area of protection for each well
Minimize contamination potential from municipal landfills.

b. **Recommended Additional Water Conservation and Source Protection Measures**
- Make residential retrofit devices available to customers.
- Install water saving devices in all public buildings

TOWN OF DIGHTON

1. **Public Water Supply System:** The Town of Dighton is served by the Dighton Water District A small portion of town is served by the North Dighton Fire District, which buys all its water from Taunton and will continue to do so.

   a. **Current and projected water demand** The base demand for the Dighton Water District was 0.69 mgd. OWR projects that the Dighton Water District will have a 2010 average day demand of 0.88 mgd, an increase of 0.19 mgd over the Base Demand. The base demand for the North Dighton Fire District was 0.15 mgd. OWR projects that the North Dighton Fire District will have a 2010 average day demand of 0.17 mgd, an increase of 0.02 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Dighton Water District currently has two ground water sources located in the Taunton River basin: Walker Street #1 and #2. The District also buys water form the City of Taunton to meet peak demands. Dighton Water District also has three ground water sources located in the Narragansett Bay and Mount Hope Bay Shores basin: Cedar Street #1, #2, and #3.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Dighton Water District and North Dighton Fire District officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

NORTH DIGHTON FIRE DISTRICT

   a. **Existing Sources**
   Continue to purchase water from Taunton.

   b. **Protecting Water Supply Sources**
   Not applicable

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources** Not applicable

DIGHTON WATER DISTRICT

a. Existing Sources

1. Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.
2. Treat existing sources as necessary.

b. Protecting Water Supply Sources

Continue to implement measures to protect local sources.

c. Water Conservation

Implement community water conservation plan to reduce the projected 2010 demand.

d. New Sources

None planned

3. **Other Water Resource Management Activities** Negotiate with the City of Taunton to increase the amount of water purchased.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. Neither the Dighton Water District nor the North Dighton Fire District have submitted a Water Conservation Plan to the Water Resources Commission. However, OWR has contacted Dighton officials to discuss conservation measures implemented or planned. The following is a summary of present and future water conservation efforts based on information from the Districts and OWR's recommendations for increasing conservation efforts.

NORTH DIGHTON FIRE DISTRICT

a. Existing programs and future conservation plans

Unaccounted-for Water: >1%

Metering:
Existing - 100% metered, (but for Fire District barn)
Meters replaced as they fail with externally read meters

Leak Detection:

Existing - No program

Pricing:
Existing -

Public Education:
Existing - Notices in bills if water use is excessively high
No schools located in the District

Drought Planning:
Existing - No plan

Water Saving Fixtures:
Existing - No program
Some fixtures distributed through the Gas and Electric Companies

Protection: Not applicable

b. **Recommended Water Conservation and Source Protection Measures**
- Prepare a Water Conservation Plan meeting Water Resources Commission guidelines
- Institute a formal leak detection program
- Make water saving fixtures available to residential customers
- Develop a formal drought response plan

DIGHTON WATER DISTRICT

a. **Existing programs and future conservation plans**

Unaccounted-for Water: >1%

Metering:
Existing - 100% metered; All meters are externally read

Leak Detection:
Existing - No program

Pricing:
Existing - Flat rate with different structures for residential and industrial customers

Public Education:
Existing -

Drought Planning:
Existing - Purchase water from Taunton

Water Saving Fixtures:
Existing - No program

Protection:
Existing -
Future -

b. **Recommended Water Conservation and Source Protection Measures**
   - Prepare a Water Conservation Plan meeting Water Resources Commission guidelines
   - Institute a formal leak detection and repair program to survey the entire system for leaks every two years
   - Make water saving fixtures available to residential customers.

TOWN OF EAST BRIDGEWATER

1. **Public Water Supply System:** The Town of East Bridgewater is served by the East Bridgewater Water Department.

   a. **Current and projected water demand** The base demand was 1.05 mgd. OWR projects that the town of East Bridgewater will have a 2010 average day demand of 1.21 mgd, an increase of 0.16 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The East Bridgewater Water Department currently has four ground water sources located in the Taunton River basin: Pond Street #1, Crescent Street #2, Washington Street #3, and Hudson Street #4.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the East Bridgewater officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Develop pending well at the East Street site in the Taunton River Main Stem subbasin.

3. **Other Water Resources Management Activities** The Town has an ongoing program of complete purge and overhaul of well sites on a rotating basis.

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The East Bridgewater Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the East Bridgewater Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 15%

Metering:
Existing - 99% metered; 85% of all meters are externally read; replaces all meters that are older than 20 years
Future - Convert to all externally read meters

Leak Detection:
Existing - Ongoing program
Ongoing system rehabilitation project
Water Audit
Future - Reduce unaccounted for water

Pricing:
Existing - Full cost pricing
Varied rate structure (commercial, residential, seasonal, etc.)

Public Education:
Existing - No program

Drought Planning:
Existing - No plan

Water Saving Fixtures:
Existing - No program

Protection:
Existing - Aquifer Protection Zoning Bylaw
Future - More specific identification of recharge areas

b. **Recommended Additional Water Conservation and Source Protection Measures**
   - Achieve 100% metering; meter all public buildings
   - Institute a public education program
   - Develop a drought/emergency plan.
   - Make residential retrofit devices available to all customers; install water-saving devices in all public buildings.

TOWN OF EASTON

1. **Public Water Supply System:** The Town of Easton is served by the Easton Department of Public Works.

   a. **Current and projected water demand** The base demand was 1.58 mgd. OWR projects that the town of Easton will have a 2010 average day demand of 2.34 mgd, an increase of 0.76 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Easton Water Department currently has five ground water sources located in the Taunton River basin: Stations #1, #2, #3, #4, #5.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Easton officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce peak demands and to reduce the projected 2010 demand.

   d. **New Sources**
      1. Develop pending well site at Wheaton Farm.
      2. Develop pending well site at Borderland.
      3. Explore for an additional source in the Town River subbasin.

3. **Other Water Resources Management Activities** None planned

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Easton Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Easton Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 4%
Metering:
Existing - 100% metered; All meters replaced every 15 years
Future - Replace meters every 10 years

Leak Detection:
Existing - Conduct leak detection survey once per year; Fix leaks as soon as possible
Future - Maintain unaccounted-for water to under 10%

Pricing:
Existing - Enterprise Account
Increasing block rate
Semiannual billing
Future - Charge true cost of water

Public Education:
Existing - Ongoing program
Future - News releases to local cable TV, papers; newsletter to be sent with water bills

Drought Planning:
Existing - Have plan

Water Saving Fixtures:
Existing - Installed in all public buildings
Sell kits
Enforce plumbing code

Protection:

Existing - Identified aquifer protection lands
Have water resources protection zoning covering all Zone IIs
Own 146.3 acres of aquifer lands

Future - Educate public
Continue sponsoring Household Hazardous Waste Collection Days and waste oil collection sites

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Continue with aggressive conservation program

TOWN OF FOXBOROUGH

1. **Public Water Supply System** The Town of Foxborough is supplied by the Foxborough Water Department.

   a. **Current and projected water demand** The base demand was 2.47 mgd.* OWR projects that Foxborough will have a 2010 average day demand of 2.67 mgd, an increase of 0.19 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Foxborough Water Department currently has four ground water stations located in the Taunton River basin: stations #2, #3, #3A and #4. Foxborough also has one groundwater stations located in the Neponset River Basin: station #1.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with Foxborough Water Department officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Complete development of pending Morse Station #5 in the Neponset-Walpole subbasin.

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* Base Demand for Taunton River basin was calculated using different years (1987-1989) than those used in the Neponset River basin (1985-1987). Base Demand for Foxborough in the Neponset River basin plan was 2.50 mgd.

3. **Other Water Resource Management Activities** The Ten Mile River basin has not been studied by OWR to date. It has not been determined if sufficient water will be available during the planning drought for the pending Witch Pond Well.

4. Community Water Conservation Plan and Recommendations Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Foxborough Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Foxborough Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 19%

Metering:
Existing - 100% metered; ongoing meter replacement/repair program

Leak Detection:
Existing - Leak detection program in progress
Fix all leaks as soon as possible

Pricing:
Existing - Full cost pricing
Increasing block rate structure
Frequent customer billing

Public Education:
Existing - Ongoing education program including mailing inserts, school presentations, displays at library and Founders Day ceremonies, and articles in the newspaper

Drought Planning:
Existing - no plan

Water Saving Fixtures:
Existing - Enforce building and plumbing code;
Sell water saving devices to residential customers

Protection:
Existing - Identified some critical resource areas
Acquire land or development rights to resource areas

Water Resources Protection District for existing and future wells
Water Resources Protection bylaw
Identified underground storage tanks and gasoline stations near existing and future well sites
Hazardous Materials bylaws

b. **Recommended Additional Water Conservation and Source Protection Measures**
   - Reduce unaccounted for water to no more that 15%
   - Adopt an emergency response plan
   - Retrofit public buildings with water saving devices; make water saving devices available to all residential customers
   - Identify remaining critical water resource areas
   - Acquire remaining land or development rights to critical resource areas
   - Adopt a local by-law to control storage of potential contaminants
   - Eliminate bleeders

TOWN OF FREETOWN

1. **Public Water Supply System:** The Town of Freetown currently has no central public water supply, however a small portion of town is served by the New Bedford Water Department.

   a. **Current and projected water demand** The base demand for this portion of Freetown was 0.01 mgd. OWR projects that this demand will increase to 0.02 mgd by 2010. This represents an increase of 0.01 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth and an increase in residential gpcd.

2. **Water Resources Management Recommendations** See New Bedford for Water Resources and Conservation Management recommendations.

TOWN OF HALIFAX

1. **Public Water Supply System:** The Town of Halifax is served by the Halifax Water Department.

   a. **Current and projected water demand** The base demand was 0.49 mgd. OWR projects that the town of Halifax will have a 2010 average day demand of 0.66 mgd, an increase of 0.17 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Halifax Water Department currently has three ground water sources located in the Taunton River basin: Richmond Park #1 and #2, and the YMCA Well.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Halifax officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Develop proposed additional well at YMCA site in the Robbins Pond Outlet subbasin.

3. **Other Water Resources Management Activities** The Town plans to rehab the existing Richmond Park wells and use them at a reduced capacity.

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Halifax Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Halifax Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 2%

Metering:
Existing - 99% metered; Ongoing meter replacement program: all small meters replaced every 15 years; large meters replaced every ten years
Future - Continue program

Leak Detection:
Existing - Regular leak detection survey
Future - Update leak detection equipment

Pricing:
Existing - Full cost pricing
Flat Rate; Semiannual billing

Public Education:
Existing - Ongoing program

Drought Planning:
Existing - No plan

Water Saving Fixtures:
Existing - Installed in public buildings
Actively enforce plumbing code

Protection:
Existing - Own some land in excess to Zone I

b. Recommended Additional Water Conservation and Source Protection Measures

- Achieve 100% metering
- Investigate increasing block rate billing structure
- Make residential retrofit devices available to all customers
- Continue to acquire aquifer protection lands.

TOWN OF HANSON

1. **Public Water Supply System:** The Town of Hanson is served by the Hanson Water Department.

   a. **Current and projected water demand** The base demand was 0.72 mgd. OWR projects that the town of Hanson will have a 2010 average day demand of 0.90 mgd, an increase of 0.18 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Hanson Water Department currently has two ground water sources located in the Taunton River basin: Crystal Springs Gravel Packed Well and Crystal Springs Wellfield.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Hanson officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Develop pending well at Pleasant Street Site.

3. **Other Water Resource Management Activities** Continue to explore for additional well sites, however, the South Coastal basin has not been studied by OWR to date. It has not been determined if sufficient water will be available during the planning drought for the any proposed sources from the Indian Head River subbasin of this basin.

4. Community Water Conservation Plan and Recommendations

Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Hanson Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Hanson Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 7%

Metering:
Existing - 100% metered; All meters externally read
Future - Five year plan for replacement of all meters

Leak Detection:
Existing - System-wide survey conducted in 1990
Future - Develop rehabilitation plan based on the results of this survey

Pricing:
Existing - Increasing block rate
Customers billed semiannually
Future - Full cost pricing

Public Education:
Existing - Ongoing program
Notices with bill

Drought Planning:
Existing - Have plan

Water Saving Fixtures:
Existing - No program

Protection:
Existing - Aquifer protection zoning

b. Recommended Additional Water Conservation and Source Protection Measures

- Institute a regular leak detection program to survey the entire system for leaks.
- Make residential retrofit devices available to customers; install water-saving devices in all public buildings.
- Institute an enterprise account

TOWN OF MANSFIELD

1. **Public Water Supply System:** The Town of Mansfield is served by the Mansfield Water and Sewer Department.

   a. **Current and projected water demand** The base demand was 2.12 mgd. OWR projects that the town of Mansfield will have a 2010 average day demand of 2.52 mgd, an increase of 0.40 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Mansfield Water Department currently has four ground water sources located in the Taunton River basin: Cate Springs #1, Dustin #7, and Prescott #8 and #9. Mansfield also has four ground water sources located in the Ten Mile River basin: Albertini #2, #3, and #4, and Witch Pond #6.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Mansfield officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use other existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Pursue development of a pending source at the Ash Property in the Wading River subbasin.

3. **Other Water Resource Management Activities** Discontinue plans to build a treatment plant at Dustin Well #7 in the Canoe River subbasin. A hydrologic analysis of this subbasin has determined that there would be insufficient volume of water during the planning drought for the use of this well. The well may help to meet demand during normal and peak demand periods under normal hydrologic conditions. This subbasin has also been identified as having a significant trout population. Use this source only in emergencies.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Mansfield Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Mansfield Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 25%
Metering:
Existing - 99.3% metered; Ongoing meter upgrade and repair program
Future - Update entire system with externally read system

Leak Detection:
Existing - Flush system twice per year; listen for leaks at that time
Future - Have hired contractor to train personnel to conduct leak detection surveys; will conduct a modified leak detection survey as part of training
Reduce unaccounted-for water to no more than 10%

Pricing:
Existing - Flat Rate
Customers billed quarterly

Public Education:
Existing - Ongoing
Messages printed on bills

Drought Planning:
Existing - No plan

Water Saving Fixtures:

Existing - No program
Enforce plumbing code
Future - Make residential retrofit devices available to all customers

Protection:

Existing - Water resources protection districts
Future - Stricter aquifer protection bylaws
Acquisition of lands within Zone II

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Reduce unaccounted-for water to no more than 15%
- Encourage large water users to institute water-saving systems
- Achieve 100% metering
- Institute a formal leak detection program to survey the entire system for leaks every 2 years.
- Investigate increasing block rate billing system
- Develop a drought/emergency plan
- Install water-saving devices in all public buildings

TOWN OF MIDDLEBOROUGH

1. **Public Water Supply System:** The Town of Middleborough is served by the Middleborough Water Department.

   a. **Current and projected water demand** The base demand was 1.82 mgd. OWR projects that the town of Middleborough will have a 2010 average day demand of 3.03 mgd, an increase of 1.21 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Middleborough Water Department currently has 11 ground water sources located in the Taunton River basin: East Grove Street, Rock #1 and #2, Miller Street, Tispaquin #1 and #2, Plympton Street, East Main Street #1 and #2, Spruce Street, and Cross Street. The City of Taunton supplies some industrial parks within the Town.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Middleborough officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
      1. Pursue development of proposed water supply source at the Mizares site in the Taunton River Main Stem.
      2. Pursue development of proposed water supply source at Wilbur Farm in the Nemasket River subbasin.

3. **Other Water Resource Management Activities** Investigate potential interconnection with Taunton.

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Middleborough Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Middleborough Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 20%

Metering:
Existing - 100% metered; Ongoing program to update 400 meters per year. The Town has had a special metering program which has replaced 1,000 meters with externally-read meters during the past two years.

Leak Detection:
Existing - Annual leak detection survey
Leaks are fixed immediately

Pricing:
Existing - Enterprise Account
Increasing block rate
Customers billed semiannually
Future - Review pricing annually
Complete formal study based on American Water Works Association standards for rate making

Public Education:
Existing - Ongoing
Future - Develop video outlining water problems, corrective measures and ways to save water

Drought Planning:
Existing - Have plan

Water Saving Fixtures:

Existing - Rigorously enforce plumbing code
Distributed water saving fixtures to residential customers
Installed water saving fixtures in public buildings
Have worked with Ocean Spray Cranberries and the municipal waste water treatment plant to reduce water consumption through the use of recirculation systems
Enforce the plumbing code

Future - Continue to encourage use of water saving fixtures through bill stuffers

Protection:

Existing - Identified and purchased aquifer protection lands
Have water resources protection zoning bylaw

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Reduce unaccounted for water to no more than 15%
- Continue to work with Ocean Spray and other large users to encourage water conservation through use of recycling or other water saving processes.

CITY OF NEW BEDFORD

1. **Public Water Supply System:** The City of New Bedford is served by the New Bedford Water Department.

   a. **Current and projected water demand** The base demand for the City was 17.47 mgd. In addition, New Bedford supplied water to Acushnet, Freetown and Dartmouth for a total of approximately 18.48 mgd. OWR projects that City of New Bedford (alone) will have a 2010 average day demand of 19.58 mgd, an increase of 2.11 mgd over the Base Demand. The City will continue to supply Acushnet, Freetown and Dartmouth, increasing the demand on its sources to 20.77 in 2010. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The New Bedford Water Department currently has five surface water sources located in the Taunton River basin: Little Quittacas Pond, Great Quittacas Pond, Assawompsett Pond, Pocksha Pond, and Long Pond.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the New Bedford officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
      1. Implement community water conservation plan to reduce the projected 2010 demand.
      2. Work with industry to promote conservation.

   d. **New Sources**
   None

3. **Other Water Resource Management Activities**

1. Pursue a joint safe yield study of the Lakeville Ponds Complex with the city of Taunton.
2. Investigate the use of Acushnet Reservoir as a possible additional source, however, the Buzzards Bay basin has not been studied by OWR to date. It has not been determined if sufficient water will be available during the planning drought for the any proposed sources form this basin.

4. **Community Water Conservation Plan and Recommendations**

Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The New Bedford Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the New Bedford Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 12%

Metering:
Existing - 100% metered; Regular meter testing program
Future - Convert all domestic meters to remote reading

Leak Detection:
Existing - No program
Future - Clean and line system on a continuous basis

Pricing
Existing - Flat Rate
Future - Investigating different rate structures to make pricing more equitable

Public Education:
Existing - No ongoing program
Encourage voluntary conservation
Future - Develop formal public education program

Drought Planning:
Existing - Have plan

Water Saving Fixtures:

Existing - Require all three ton or greater air conditioners to employ recycling
Enforce plumbing code

Protection:

Existing - Own 3.2% of watershed
Conduct watershed patrols
Have accord with towns where watershed is located

Future - Purchase more acreage
Work with towns of Lakeville, Freetown, Middleborough, and Rochester to protect watershed

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Conduct water audit
- Institute a system-wide leak detection program to survey the entire system (including services in Freetown) for leaks every 2 years
- Encourage Acushnet to conduct a leak detection survey of its system
- Institute an enterprise account
- Institute a public education program
- Make residential retrofit devices available to all customers; install water-saving devices in all public buildings
- Encourage large users to conserve water through converting to less water-intensive processes (e.g. recycling of water)

TOWN OF NORTON

1. **Public Water Supply System:** The Town of Norton is served by the Norton Water Department.

   a. **Current and projected water demand** The base demand was 1.29 mgd. OWR projects that the town of Norton will have a 2010 average day demand of 1.85 mgd, an increase of 0.56 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Norton Water Department currently has five ground water sources located in the Taunton River basin: Stations 1, 2 (not in use), 3, 4, and 5.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Norton officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
      1. Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.
      2. Rehabilitate Well #2 in the Three Mile River subbasin.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Investigate development of a proposed additional well at the Plain Street site in the Three Mile River subbasin.

3. **Other Water Resource Management Activities** Discontinue investigation of an additional well at the Newland Avenue site in the Canoe River subbasin. A hydrologic analysis of this subbasin has determined that there would be insufficient volume of water during the planning drought for the use of this well. This subbasin has also been identified as having a significant trout population.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Norton Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Norton Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 13%

Metering:
Existing - 65% metered; All public buildings are metered
Meter installation program with goal of 100% metering within the next year
Future - Once metering is complete, will institute an ongoing meter testing and repair program

Leak Detection:
Existing - Annual leak detection survey
Future - Assess frequency of leak detection surveys once metering is complete and unaccounted-for figure is determined

Pricing:
Existing - Enterprise Account
Increasing block rate

Public Education:
Existing - Ongoing program in schools
Lawn sprinkling schedule
Future - Notices in bills

Drought Planning:
Existing - No plan
Future - Pursue connections with the Towns of Easton, Taunton, and Mansfield

Water Saving Fixtures:

Existing - Distributed to residential customers
Installed in public buildings
Enforce plumbing code

Future - Continue to install in water saving fixtures in homes
Target large industrial users

Protection:

Existing - Identified aquifer recharge areas
Own 3% of aquifer protection district
Have stringent aquifer protection bylaw

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Continue with aggressive conservation program

TOWN OF PLAINVILLE

1. **Public Water Supply System:** The Town of Plainville is served by the Plainville Water Department.

   a. **Current and projected water demand** The base demand was 0.53 mgd. OWR projects that the town of Plainville will have a 2010 average day demand of 0.58 mgd, an increase of 0.05 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Plainville Water Department currently has two ground water sources located in the Taunton River basin: Wells #1 and #2. Plainville also has one ground water source located in the Ten Mile River basin: Well #3.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Plainville officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
      1. Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.
      2. Proceed with treatment plant for Wells 1 & 2.
      3. Pursue treatment of Wells 3a & 3b.

   b. **Protecting Water Supply Sources**
      Continue to implement measures to protect local sources.

   c. **Water Conservation**
      Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
      See 3

   e. **Emergency Sources**
      Investigate increasing the use of interconnections with North Attleborough and Foxborough to meet demands during drought periods.

3. **Other Water Resource Management Activities** OWR has identified Plainville as a deficit community. Existing and planned sources will not serve to meet the community's projected 2010 demand in a planning drought. A subbasin hydrologic analysis of the Wading River at Mansfield subbasin has determined that there would be insufficient volume of water during the planning drought for the pending Wells 4 and 5. These wells may help to meet demand during normal and peak demand periods under normal hydrologic conditions. This subbasin has also been identified as having a significant trout population. These sources should only be used when streamflow in the Taunton River is above the minimum streamflow threshold. The Ten Mile River basin has not been studied by OWR to date. It has not been determined if sufficient water will be available during the planning drought for any potential sources. the Town may have to rely more heavily on emergency sources during a moderate drought.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Plainville Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Plainville Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 24%

Metering:
Existing - 99% metered; Currently working on a complete meter modernization program
Future - Install all externally read meters

Leak Detection:
Existing - Listen to hydrants twice a year
Future - Will conduct a semiannual in-house program for leak detection

Pricing:
Existing - Flat Rate
Billed semiannually
Future - Full cost pricing

Public Education:
Existing - No program
Future - Conservation messages in bills
Elementary school program

Drought Planning:
Existing - No program
Future - Develop a drought/emergency plan

Water Saving Fixtures:
Existing - No program
Enforce plumbing code
Future - Direct distribution to households

Protection:
Existing - Identified aquifer protection lands
Some lands purchased by the Conservation Commission

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Reduce unaccounted-for water to no more than 15%
- Encourage large users to install water saving systems
- Achieve 100% metering; install meters in all public buildings
- Conduct a water audit
- Investigate increasing block rate billing structure
- Institute an Enterprise Account
- Make residential retrofit devices available to all customers; install water-saving devices in all public buildings
- Institute an aquifer protection bylaw

TOWN OF RAYNHAM

1. **Public Water Supply System:** The Town of Raynham is served by two water districts: the North Raynham Water District and the Raynham Center Water District.

   a. **Current and projected water demand** The base demand was 0.32 mgd for the North Raynham Water District and 0.74 mgd for the Raynham Center Water District. OWR projects that the North Raynham Water District will have a 2010 average day demand of 0.90 mgd, an increase of 0.58 mgd over the Base Demand, and that the Raynham Center Water District will have a 2010 average day demand of 1.20 mgd, an increase of 0.46 mgd over the Base Demand. These increases in demand are accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The North Raynham Water District currently has three ground water sources located in the Taunton River basin: King Philip 1 and 2, and First Street Station. The Raynham Center Water District has three ground water sources located in the Taunton River basin: Nip #1 and #2, and Johnson's Pond Wellfield.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Raynham officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   North Raynham Water District

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

d. **New Sources**
Develop pending satellite well at First Street in the Forge River subbasin.

3. **Other Water Resource Management Activities** None planned

Raynham Center Water District

a. **Existing Sources**
Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

b. **Protecting Water Supply Sources**
Continue to implement measures to protect local sources.

c. **Water Conservation**
Implement community water conservation plan to reduce the projected 2010 demand.

d. **New Sources**
1. Continue with development of treatment plant at the Gushee Pond well site in the Forge River subbasin.
2. Complete development of pending well at Johnson Pond wellfield in the Forge River subbasin.

3. **Other Water Resource Management Activities** None planned

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The North Raynham Water District has not submitted a Water Conservation Plan to the Water Resources Commission; the Raynham Center Water District has. OWR has been in contact with the North Raynham Water District to discuss conservation measures implemented or planned. The following is a summary of present and future water conservation efforts based on information from the North Raynham Water District and the Raynham Center Water District and OWR's recommendations for increasing conservation efforts.

NORTH RAYNHAM WATER DISTRICT

a. **Existing programs and future conservation plans**

Unaccounted-for Water: 5%

Metering:
Existing - 99% metered; 1% nonreading
Meters repaired biannually
Not all public buildings are metered

Leak Detection:
Existing - Conduct survey every six months

Pricing:
Existing - Flat rate
Customers billed quarterly
Full cost pricing

Public Education:
Existing - Notices in newspapers
Future - Computerized billing with space for conservation notices

Drought Planning:
Existing - No plan
Future - Will develop plan by 1992

Water Saving Fixtures:
Existing - Installed in public buildings
Enforce plumbing code

Protection:
Existing - Aquifer protection bylaw passed in 1990

b. **Recommended Additional Water Conservation and Source Protection Measures**
- Meter all public buildings in District; institute an on-going meter replacement and repair program.
- Prepare Water Conservation Plan meeting Water Resources Commission guidelines

RAYNHAM CENTER WATER DISTRICT

a. **Existing programs and future conservation plans**

Unaccounted-for Water: 8%

Metering:
Existing - 99% metered; New meters installed as old ones fail

Leak Detection:
Existing - No program
Fix leaks within 24 hours

Pricing:
Existing - Full cost pricing
Flat rate
Customers billed quarterly

Public Education:
Existing - No program
Bill stuffers, flyers

Drought Planning:
Existing - No plan
Future - Develop plan

Water Saving Fixtures:
Existing - No program

Protection:
Existing - Aquifer protection bylaw passed in 1990
Own 75 acres around new sources
Future - Identified aquifer recharge areas for future well sites

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Achieve 100% metering; institute an ongoing meter replacement and repair program; meter all public buildings within the district
- Conduct a water audit
- Institute a system-wide leak detection program to survey the entire system for leaks every 2 years
- Institute a public education campaign
- Make residential retrofit devices available to all customers; install water-saving devices in all public buildings within the district

TOWN OF SHARON

1. **Public Water Supply System** The Town of Sharon is supplied by the Sharon Department of Public Works .

   a. **Current and projected water demand** The base demand was 1.54 mgd. OWR projects that Sharon will have a 2010 average day demand of 1.62 mgd, a decrease of 0.08 mgd from the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Sharon Public Works Department currently has two wells located in the Taunton River basin: wells #5 and #6. Sharon also has three ground water sources in the Neponset River Basin: wells #2, #3 and #4.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with Sharon Public Works Department officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
      1. Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.
      2. Maintain interconnection with the Town of Canton for use when community demands exceeds local source yield due to limited additional source potential.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   Investigate groundwater sources in the Neponset River-Massapoag Brook subbasin and/or the Taunton River-Mulberry Meadow Brook subbasin to meet projected 2010 demands during the planning drought. If a Taunton River-Mulberry Meadow Brook source is developed, the source should only be used when the streamflow is above the Taunton River minimum streamflow threshold.

3. **Other Water Resources Management Activities** A subbasin hydrologic analysis of the Rumford River subbasin has determined that there would be insufficient volume of water during the planning drought for the pending Gavins Pond well. The Gavins Pond well may help to meet demand during normal and peak demand periods under normal hydrologic conditions. This source should only be used when streamflow in the Taunton River is above the minimum streamflow threshold.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Sharon Public Works Department has submitted a Water Conservation Plan for the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Sharon Public Works Department and OWR's recommendations for increasing conservation efforts.

   a. Existing programs and future conservation plans

   Unaccounted-for Water: 4%
   Metering:
   Existing - 99% metered; ongoing metering program

   Leak Detection:
   Existing - Fix all leaks as soon as possible

   Pricing:
   Existing - Full cost pricing
   Increasing block rate structure

   Public Education:
   Existing - Ongoing education program including mailing inserts and school presentations

   Drought Planning:
   Future - adopt an emergency response plan

Water Saving Fixtures:
Existing - Enforce building and plumbing code;
Retrofit public buildings
Future - Retrofit all residential buildings

Protection:
Existing - Identified critical resource areas
Acquire land or development rights to resource areas
Adopt zoning to protect critical resource areas
Bylaws to control storage of potential hazardous materials

b. **Recommended Additional Water Conservation and Source Protection Measures**
- Implement an ongoing leak detection program to survey the entire system for leaks every two years
- Increase frequency of customer billing
- Achieve 100% metering
- Conduct a water audit

TOWN OF SOMERSET

1. **Public Water Supply System:** The Town of Somerset is served by the Somerset Water Department.

   a. **Current and projected water demand** The base demand was 3.02 mgd. OWR projects that the town of Somerset will have a 2010 average day demand of 4.42 mgd, an increase of 1.40 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Somerset Water Department currently has one surface water source, the Somerset Reservoir, which is augmented by the Segregansett River, and one ground water source, the Brook Street Well, all located in the Taunton River basin.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Somerset officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   None Planned

3. **Other Water Resource Management Activities** Expand treatment plant at Somerset Reservoir.

4. **Community Water Conservation Plan and Recommendations**

Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Somerset Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Somerset Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 17%

Metering:
Existing - 99% metered; Replace 100 meters per year
Future - Install externally read meters

Leak Detection:
Existing - No program; in process of closing dead ends
Fix leaks as soon as possible
Future - Replace older water mains

Pricing:
Existing - Flat rate
Future - Enterprise Account

Public Education:
Existing - No program

Drought Planning:
Existing - Have plan and emergency bylaw

Water Saving Fixtures:
Existing - Installed in public buildings
Enforce plumbing code

Protection:
Existing - Water resources protection zoning

b. Recommended Additional Water Conservation and Source Protection Measures

- Reduce unaccounted-for water to no more than 15%
- Achieve 100% metering
- Institute a system-wide leak detection program to survey the entire system for leaks every two years.
- Institute an enterprise account.
- Institute an increasing block rate billing system
- Make residential retrofit devices available to all customers

- Work with large users to encourage water conservation

TOWN OF STOUGHTON

1. **Public Water Supply System** The Town of Stoughton is supplied by the Stoughton Department of Public Works .

   a. **Current and projected water demand** The base demand was 2.26 mgd. OWR projects that Stoughton will have a 2010 average day demand of 2.41 mgd, an increase of 0.15 mgd over the Base Demand. This increase in demand is accounted for by an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Stoughton Public Works Department currently has four ground water sources in the Taunton River basin: wells #3, #4, #5 and Goddard well. Stoughton also has three wells located in the Neponset River Basin: wells #1, #2 and Pratt Court well.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with Stoughton Public Works Department officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
      1. Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.
      2. Maintain interconnection with the Town of Canton for use when community demand exceeds local source yield due to limited local source potential.

   b. **Protecting Water Supply Sources**
      Continue to implement measures to protect local sources.

   c. **Water Conservation**
      Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
      Investigate and develop groundwater source in the Taunton River-Matfield subbasin to meet projected 2010 demands during the planning drought, provided that the streamflow in the Taunton River is above the minimum streamflow threshold.

3. **Other Water Resource Management Activities** None planned

4. **Community Water Conservation Plan and Recommendations**

Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. Stoughton Public Works Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Stoughton Public Works Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 26%

Metering:
Existing - 99% metered; ongoing metering program

Leak Detection:
Existing - Periodic leak detection program
Fix all leaks as soon as possible
Future - Ongoing leak detection program

Pricing:
Existing - Full cost pricing
Increased Block rate structure
Frequent customer billing
Enterprise account

Public Education:
Existing - Ongoing education program including mailing inserts and school presentations

Drought Planning:
Existing - an unwritten emergency response plan

Water Saving Fixtures:
Existing - Enforce building and plumbing code;
Retrofit public buildings
Retrofit residential buildings

Protection:

Existing - Identified critical resource areas
Acquire land or development rights to resource areas

Future - Adopt zoning to protect critical resource areas
Bylaws to control storage of potential hazardous materials

b. **Recommended Additional Water Conservation and Source Protection Measures**

- Adopt an emergency response plan
- Acquire remaining land or development rights to critical resource areas
- Reduce unaccounted-for water to no more than 15%
- Achieve 100% metering

CITY OF TAUNTON

1. **Public Water Supply System:** The City of Taunton is served by the Taunton Water Department.

   a. **Current and projected water demand** The base demand was 5.82 mgd. OWR projects that the city of Taunton will have a 2010 average day demand of 8.41 mgd, an increase of 2.59 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Taunton Water Department currently has four surface water sources located in the Taunton River basin: Assawompsett Pond, Long Pond, Pocksha Pond, and Elders Pond.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Taunton officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect local sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   None Planned

3. **Other Water Resource Management Activities** Pursue a joint safe yield study of the Lakeville Ponds Complex with the City of New Bedford.

4. **Community Water Conservation Plan and Recommendations**
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Taunton Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Taunton Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 16%

Metering:
Existing - 100% metered; Ongoing meter replacement and repair program
Future - Goal to have 75% of all meters be less than 10 years old
Implement computerized meter reading program

Leak Detection:
Existing - Ongoing system rehabilitation program to eliminate dead ends and bleeders
Have leak detection equipment; use as needed
Regularly listen for leaks at meters and curb stops
Regularly compare pumping and billing rates
Periodically listen for leaks at valves and hydrants
Future - Eliminate bleeders by 2000

Pricing:
Existing - Enterprise Account
Flat rate

Public Education:
Existing - No program

Drought Planning:
Existing - No plan

Water Saving Fixtures:
Existing - Work with building/plumbing inspectors to enforce plumbing code for new construction
Future - Install water saving fixtures in all public buildings

Protection:
Existing - Owns 1% of watershed
Future - Work with Towns of Lakeville, Freetown, Middleborough and Rochester to protect sources.

b. **Recommended Additional Water Conservation and Source Protection Measures**
- Reduce unaccounted-for water to no more than 15%
- Work with large users for conservation
- Expand leak detection program to services in North Dighton and Berkley. Once the system rehab program is complete, schedule regular leak detection surveys
- Institute a public education program
- Develop a drought/emergency plan
- Make residential retrofit devices available to all customers
- Pursue acquisition of watershed lands or development rights to watershed lands

TOWN OF WEST BRIDGEWATER

1. **Public Water Supply System:** The Town of West Bridgewater is served by the West Bridgewater Water Department.

   a. **Current and projected water demand** The base demand was 0.85 mgd. OWR projects that the town of West Bridgewater will have a 2010 average day demand of 1.53 mgd, an increase of 0.67 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The West Bridgewater Water Department currently has five ground water sources located in the Taunton River basin: Cyr Street #1, #4 and #5, Norman Avenue #2, and Manley Street #3.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the West Bridgewater officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   The Town has always had an aggressive program to purchase land to protect potential water supply sites. Continue to implement these measures to protect current and potential sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   None planned

3. **Other Water Resources Management Activities** Continue planning for future needs and exploring for potential well sites in the Town and Matfield subbasins.

4. **Community Water Conservation Plan and Recommendations**

Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The West Bridgewater Water Department has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the West Bridgewater Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water: 34%

Metering:
Existing - 98% metered; Ongoing meter modernization program to replace 10% of all meters per year; converting to remotely read meters
Future - Ongoing replacement program to replace residential meters every ten years and replace industrial/commercial meters every five years

Leak Detection:
Existing - Performed survey in 1990
Fix leaks within 48 hours
Future - Survey 25% of town each year

Pricing:
Existing - Enterprise account
Flat rate with different rates for residential and industrial customers

Public Education:
Existing - Ongoing public education

Drought Planning:
Existing - Have plan
Future - Interconnections with neighboring towns

Water Saving Fixtures:
Existing - Installed in public buildings
Enforce plumbing code

Protection:
Existing - Aquifer protection bylaw
Own about 80% of aquifer protection lands

Future - Continue to acquire land for current and future water supply sources

b. **Recommended Additional Water Conservation and Source Protection Measures**
   - Reduce unaccounted-for water to no more than 15%
   - Achieve 100% metering
   - Make residential retrofit devices available to customers

TOWN OF WHITMAN

1. **Public Water Supply System:** The Town of Whitman is served by the Whitman Department of Public Works, which purchases all its water from the Brockton Water Department.

   a. **Current and projected water demand** The base demand was 0.96 mgd. OWR projects that the town of Whitman will have a 2010 average day demand of 1.13 mgd, an increase of 0.18 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

2. **Water Resources Management Recommendations** The following water resources management recommendations were developed by OWR in cooperation with the Whitman officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to purchase water from Brockton.

   b. **Protecting Water Supply Sources**
   Work with the City of Brockton to protect source at Silver Lake.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   None Planned

3. **Other Water Resource Management Activities** Continue to work with Old Colony Planning Council to investigate buying water from neighboring communities to meet short term demands.

4. **Community Water Conservation Plan and Recommendations** Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Whitman Water Department has not submitted a Water Conservation Plan to the Water Resources Commission. However, OWR has been in contact the Water Department to discuss conservation measures

implemented or planned. The following is a summary of present and future water conservation efforts based on information from the Whitman Water Department and OWR's recommendations for increasing conservation efforts.

a. Existing programs and future conservation plans

Unaccounted-for Water:

Metering:
Existing - 100% metered; Ongoing meter replacement program

Leak Detection:
Existing - No formal program

Pricing:
Existing - Flat rate

Public Education:
Existing -

Drought Planning:
Existing -

Water Saving Fixtures:
Existing - Some public buildings have had water saving fixtures installed; the Gas Company has made them available to residential customers
Recommend devices to customers

Protection:
Existing - No program

b. Recommended Additional Water Conservation and Source Protection Measures

- Prepare a Water Conservation Plan meeting Water Resource Commission guidelines.
- Investigate increasing block rate billing system
- Institute formal system-wide leak detection program to survey the entire system every two years
- Work with the City of Brockton to protect existing sources

TOWN OF WRENTHAM

1. Public Water Supply System: The Town of Wrentham is served by the Wrentham Department of Public Works, Water Division.

   a. **Current and projected water demand** The base demand was 1.19 mgd. OWR projects that the town of Wrentham will have a 2010 average day demand of 1.32 mgd, an increase of 0.13 mgd over the Base Demand. This increase in demand is accounted for by an increase in population growth, an increase in industrial and commercial water use, and an increase in residential gpcd.

   b. **Current water supply sources** The Wrentham Department of Public Works currently has one ground water source located in the Taunton River basin: the Thurston Street Well. Wrentham also has two ground water sources in the Charles River basin: Franklin Well #2 and #3.

2. Water Resources Management Recommendations The following water resources management recommendations were developed by OWR in cooperation with the Wrentham officials. OWR analysis indicates that the development of these recommended water supply alternatives along with conservation efforts, will enable the community to meet projected 2010 water demand under planning drought conditions.

   a. **Existing Sources**
   Continue to use existing water supply sources at registered volumes and approved withdrawal permit volumes under the DEP Water Management Act.

   b. **Protecting Water Supply Sources**
   Continue to implement measures to protect current and potential sources.

   c. **Water Conservation**
   Implement community water conservation plan to reduce the projected 2010 demand.

   d. **New Sources**
   None

3. Other Water Resources Management Activities OWR has identified Wrentham as a deficit community. Existing and planned sources will not serve to meet the community's projected 2010 demand in a planning drought. The Town may have to rely more heavily on emergency sources to meet demand in a moderate drought.

4. Community Water Conservation Plan and Recommendations
Guidelines for developing a Water Conservation Plan, outlined in the Components of a Minimum Conservation Plan, were developed by the Water Resources Commission to facilitate the implementation of the state requirement that communities develop local water resources management plans. The Wrentham Department of Public Works has submitted a Water Conservation Plan to the Water Resources Commission. The following is a summary of present and future water conservation efforts based on information from the Wrentham Department of Public Works and OWR's recommendations for increasing conservation efforts.

a. **Existing programs and future conservation plans**

Unaccounted-for Water: 42%

Metering:
Existing - 99% metered; Ongoing meter modernization program

Leak Detection:
Existing - Ongoing leak detection program
Fix all leaks as soon as possible

Pricing:
Existing - Enterprise account
Flat rate
Future - Full cost pricing

Public Education:
Existing - No program

Drought Planning:
Existing - No plan

Water Saving Fixtures:
Existing - No program

Protection:
Existing - Identified critical resources areas
Acquired land or development rights to resource areas

b. **Recommended Additional Water Conservation and Source Protection Measures**
- Reduce unaccounted-for water to no more than 15%
- Achieve 100% metering
- Develop a drought/emergency plan
- Make residential retrofit devices available to all customers; install water saving devices in all

public buildings
- Work with large users for water conservation
- Implement increasing block rate structure
- Increase frequency of customer billing
- Implement a public education program through schools and mailings
- Adopt zoning to protect water resource areas
- Adopt a local by-law to control storage of potential contaminants
- Enforce plumbing code

Appendix 1

INDUSTRIAL SELF-SUPPLIED WATER USE

Self-Supplied Industrial Water Users: Eight self-supplied industrial water users with a 1981-1985 registered average day demand of 100,000 gallons per day or more have been located in the Taunton River basin. The self-supplied industries are located in Attleboro (Texas Instruments), North Carver (Nemasket Sand and Gravel), Dighton (ICI Americas and P.Bradshaw Corp.), Freetown (COM/Energy Freetown Realty Trust), Lakeville (Lakeville Sand and Gravel), Middleborough (Byrne Sand and Gravel), and Taunton (Harodite Finishing).

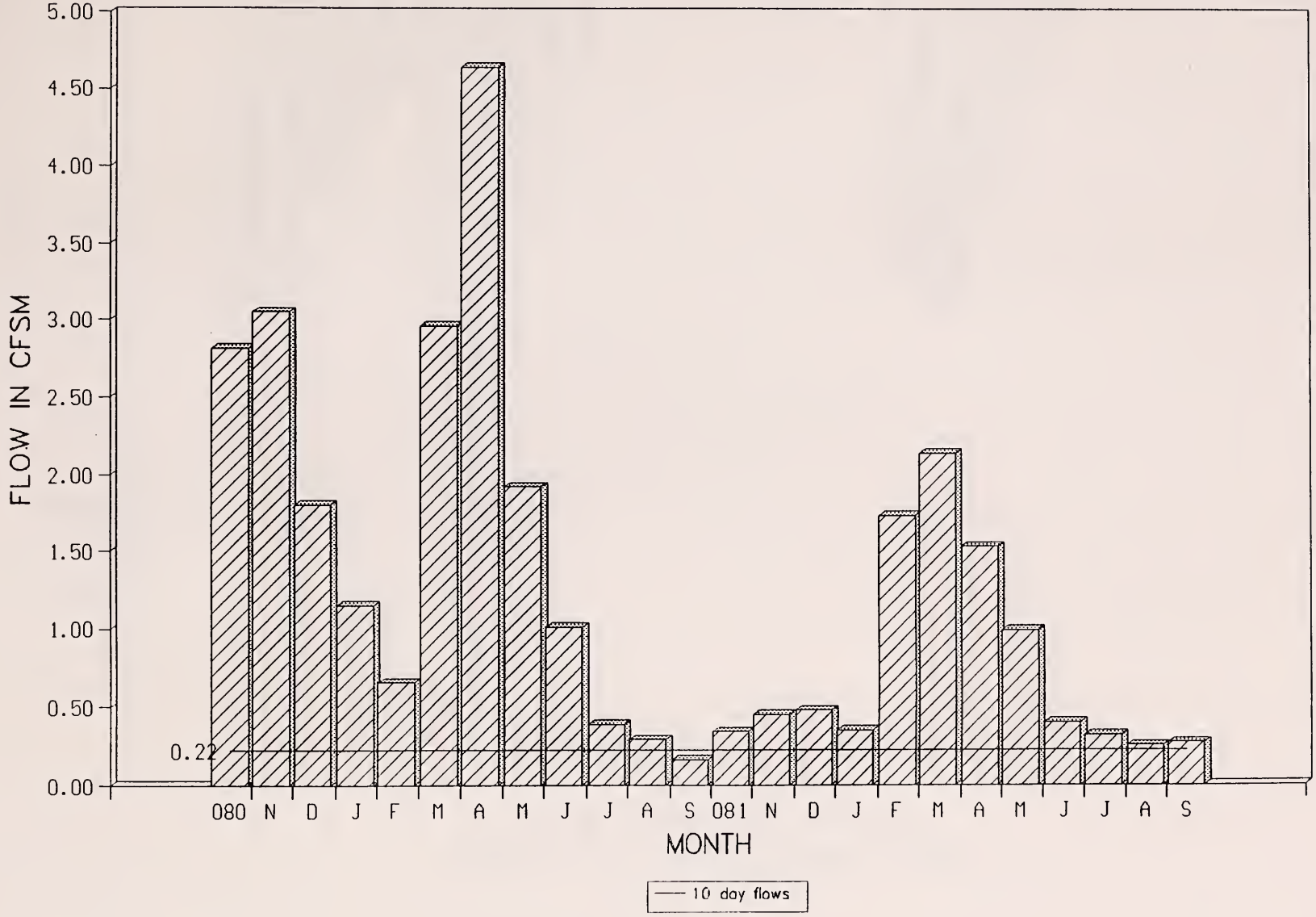
Current Water Demand: The DEP registered withdrawals total approximately 6.83 mgd. All of the industries return their withdrawals to the basin.

Water Conservation Management: It is recommended that the eight industries continue conservation efforts.

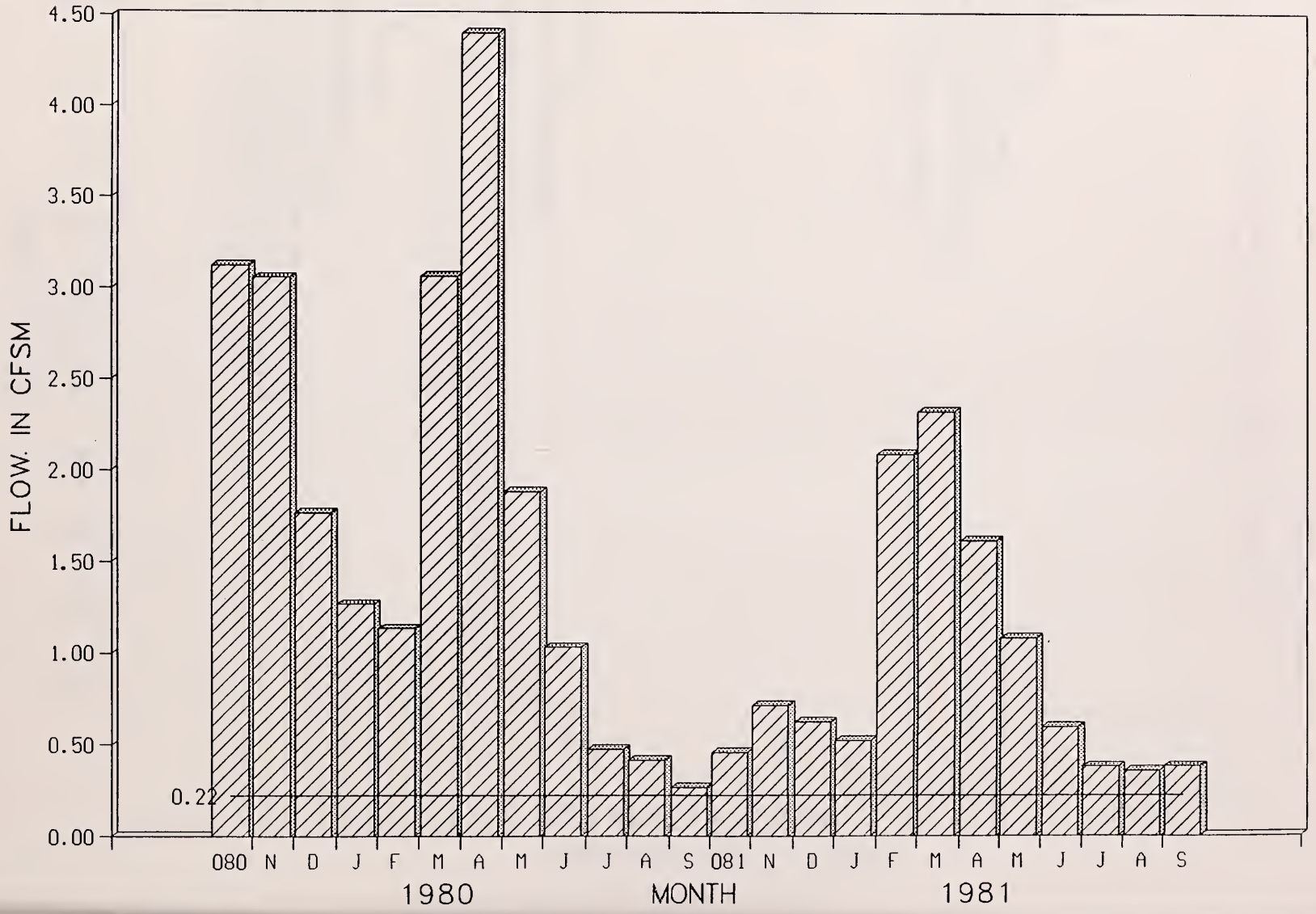
Appendix 2

Hydrographs for USGS Gaging Stations
Taunton River Basin

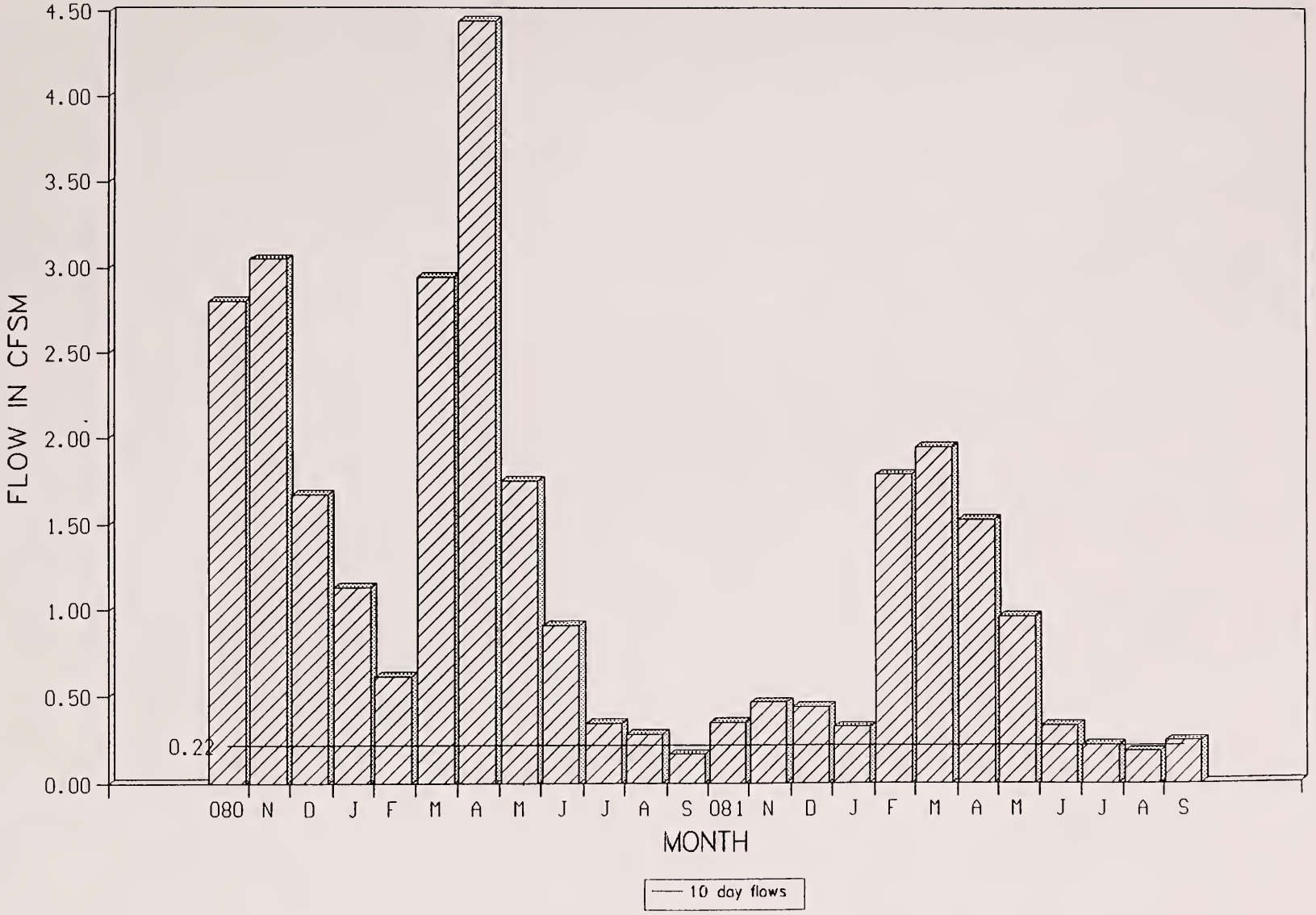
THREEMILE RIVER FLOWS
1980'S DROUGHT



GENERATED TAUNTON RIVER FLOWS
STATE FARM GAGE 1980'S



WADING RIVER FLOWS
1980'S DROUGHT



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